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HANDBOOK
OF
HARDY HERBACEOUS AND
ALPINE FLOWERS

HANDBOOK
OF
HARDY HERBACEOUS AND
ALPINE FLOWERS



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INTRODUCTION.

THIS book is written in the hope that it may be useful in disseminating a better knowledge of the general character, uses, and culture of hardy herbaceous and alpine perennial flowers. It will be admitted, I believe, very generally, that an intimate knowledge of these neglected classes of plants has not for many years been regarded as a necessary accomplishment in a professional gardener. Herbaceous and alpine plants have been so long banished from gardens of all grades, that they have become unfamiliar to those even who once knew them well ; and the mass of those who have embraced gardening as a business pursuit or a means of recreation within the past twenty-five or thirty years, have had few opportunities for acquiring any but the slightest knowledge of them of either a practical or theoretical kind. For until within the past few years, so little general interest had been taken for long previously in these old useful tribes of plants, that even the periodical press, on which we depend for guidance in our tastes and objects, has rarely been encouraged to make any but passing allusions to

the introduction of new species, while the names of the older ones have been of the rarest occurrence in its pages.

There are, however, many signs of a reaction in their favour at the present time. They may never occupy the exclusive place they once did in gardens, nor is it desirable that they should do so : but that they are destined to rise high in popular favour again has for some years past been very obvious. The prominent attention they are receiving in the gardening periodical press, the introduction of many of them into certain public gardens, the incorporation of a few of their number in the ranks of "bedding" plants, and the general spirit of inquiry that is afloat regarding them, are all signs of their increasing importance, and auguries of their future favour.

Many that are now turning their attention to inquire after these plants find that the kind of information they are in search of does not exist in a collective, handy, and inexpensive form, and that it is only attainable at great cost, and by wading through libraries accessible only to the few, or by studying the plants themselves in the various botanic gardens in which they have taken refuge during the time of their eclipse. An attempt is made in this work to supply the desideratum indicated.

As regards the plan of the book, it is so simple and self-explanatory as to call for no special remark here. It is, perhaps, novel, in so far as relates to the arrangement of the genera and species in their natural orders ; that feature, so far as I am aware, being new to books specially devoted to the instruction of professional and amateur cultivators of flowers. To friends competent to give an opinion on the matter, and to myself, that

plan presented advantages superior to those of a mere alphabetical arrangement; and as it presents a ready means of reference, and is calculated, besides, to show at a glance the relative floricultural importance of the various orders, and to be of some use in stimulating gardeners and others to inquire into the principles on which the affinities of plants are based, it is hoped that it may prove generally convenient and acceptable.

The descriptions of the species are couched in the plainest terms consistent with impressing on the mind of the reader the general character and value of the plant from an ornamental point of view. In pursuance of this object, I have confined my attention chiefly to those features of plants which are essential to the production of effect in the flower-garden, such as stature, habit, foliage, the general character of the inflorescence, and the colour and duration of the flowers. To have described the more minute features and organs on which the exact generic and specific characters are founded, would have necessitated the employment of technicalities by no means attractive to the unscientific reader, and, without securing any compensating advantage, the bulk of the book would have swollen to expensive proportions, and the popular character which it has been my desire to give it would have been sacrificed. Although, therefore, scientific precision and completeness have in no case been aimed at in the descriptions, it is hoped that they will prove generally helpful, not only in the selection, but also in the identification, of species. I have been careful to adopt those names of genera and species only that are approved by the best authorities; but, for the convenience of readers who may be ac-

quainted with species under different names, the synonyms are added in all important cases in which I am cognisant of a duplicity of names.

The selections have been made freely, but by no means exhaustively, from the various natural orders comprising ornamental herbaceous and alpine plants. Most of the old plants that were popular in British gardens before the introduction of "bedding-out," and many beautiful new ones that have been introduced since that time, are described in the body of the work. Among the many considerations that influenced me in making the selections, the chief were the claims of the parterre, the mixed border, and rockwork; our groves, wild places, and waters; and the important requirements of amateurs and cottagers.

Ample practical details of various means and methods that may be employed in the culture and uses of herbaceous and alpine perennials, are given under the various subjects in the body of the book, and more general remarks on these points, and on methods of raising them from seed, will be added further on in these introductory pages. Before leaving matters prefatorial, it may be proper to state here the circumstances which have led to the appearance of the book, and the title on which the author has presumed to address the gardening public on the subject of which it treats. By natural bent, and the force of somewhat peculiar professional circumstances, he is an earnest lover of herbaceous and alpine plants. Whilst resident at Kew, his duties as manager of the herbaceous department brought him into daily contact with the thousands of species that form the hardy collection in that establishment; and in solving

the endless questions as to nomenclature and identity that inevitably arise in connection with so extensive a collection of plants, he had opportunities of consulting many authorities in the library, as well as authenticated specimens in the herbarium. He was privileged also, while at Kew, to make several journeys of inspection to the principal public and private collections in this country, with a view to negotiating exchange. One of these journeys alone resulted in the addition of nearly a thousand species of hardy and half-hardy plants to the collection in the royal gardens, and contributed in a large degree also to the author's own information and improvement as a cultivator. The mass of the materials worked up in this work was collected at Kew from many authorities for private use, in the form of an *omnium gatherum* of notes on plants in general, but never with a view to publication, else in the case of this fragment, at least, the fulness should have been more complete, and accompanied with the authorities whence the information given is culled.

The idea of such a publication originated with Mr William Thomson of Dalkeith, under whose editorship portions of the matter appeared from time to time in 'The Gardener' during the past four years, and to whom I am much indebted for valuable suggestions and advice relative to the book. I was further induced by solicitations from many friends, both amateur and professional, to undertake the work. In a work embracing so many details, it is hardly possible that errors have been altogether avoided; but I trust such as may appear will be found neither so numerous nor important as to affect the general value and accuracy of

the information it has been my earnest wish to impart. While I am fully aware that my opportunities have been exceptionally favourable to the acquiring of information from the best sources, I am also sensible of many disabilities in myself for authorship, which should, perhaps, have deterred me from its responsibilities. With reference to this, however, I may say that, as literature is not my profession, I am more concerned for the fate of my clients than the fate of my advocacy of their cause ; and I trust that their well-founded claims on the attention and regard of all true lovers of flowers may be established, notwithstanding the weakness of the advocate.

In passing on to *general introductory details*, it may not be amiss to inquire, at the outset, what is meant by the terms herbaceous and alpine plants. At local *hortus* shows there not unfrequently occur disputes as to what is meant by the word Herbaceous ; some holding, for instance, that bulbs and general hardy *Liliaceæ* are not herbaceous, but bulbs ; and others holding as stoutly that they are as much so as any of the *Ranunculaceæ*. The latter are right, and the former can only be justified in excluding bulbs from the category of herbaceous plants if they provide a separate class for them in their schedules, and prominently announce their ineligibility to compete in other classes of herbaceous plants. Broadly stated, herbaceous plants are those which make an annual development of stem of one year's duration only. The root may be annual, biennial, or perennial, but when the stem has fulfilled its functions, it dies in either case, and, in perennials, is produced and decays annually from the same root. In this book the plants are not all strictly herbaceous that are selected ; but the exceptions, and the

reason why they are exceptions, are pointed out together where they occur. But in this as in every other merely technical division of the vegetable kingdom embracing numerous and varied subjects, it is easy to define the typical characters, but difficult to describe them in the extremes and in exceptional cases. In the case of alpine plants, any tangible definition of the class by its features, apart from that commonly known as herbaceous, is impossible. The terms herbaceous and alpine are employed arbitrarily in these pages, and in gardens, to define the same types of vegetation, as existing under different conditions in nature; the former applies to the general herbage of the plains of all countries similar to our own in climate, and to that of those of the warmer latitudes; and the latter includes the general herbage and minute shrubs that clothe the mountains of all quarters of the earth. Beginning first to appear at the highest limits of cultivation, they ascend to the confines of perpetual snow, where life of all kind ceases to appear. In so vast a realm nature has scattered practically limitless stores of floral wealth. Much of it already lies within our reach, tempting us to appropriate and make it our own; but in the wide untrodden mountain tracts in many parts of the Old World, and in the unexplored regions of the New, more may be expected to lie hid, waiting only for the seeker in order to be found. But in scanning even slightly the species of herbaceous and alpine plants that are at hand in the botanic gardens or in the nurseries of a few men who are bestirring themselves to make collections of them, we find ample variety of habit and aspect, endless diversity and grace of foliage, and exquisite types of flowers in every imaginable hue,

and often also delicious fragrance added thereto. We find, also, subjects in flower at all seasons, the few but choice gems of winter rearing their humble blossoms laden with lessons of infinite love and encouragement to man, if he will but open his heart to receive them ; the more numerous and varied gems of spring, that leap as it were into life and beauty in a day, under the first genial influences of relenting nature ; and the numerous host of summer and autumn beauties, all preceding and ushering in each other as the weeks and months pass on, leave a rich floral memento and promise on the memory for each period of the year.

There probably never was a time when all this was more needed and rare in British flower-gardens than the present ; and the question might fairly be asked, Having once possessed this wealth of beauty to some extent, why did we not keep it, and add to it, rather than cast it wholly from us ? It could not be from want of skill to use it, nor incapacity to enjoy it ; for it may be safely affirmed that there is as little limit to the one quality as to the other in flower-gardening. Nor could it be for want of space ; for in that matter, " where there's a will there's a way," within certain limits. The introduction of the massing style, and the banishment of the old types of herbaceous and alpine plants, are coeval in the history of flower-gardening ; and the former, it may be assumed, was the direct cause of the misfortunes of the other. Any unbiassed mind will, however, admit, that " bedding-out " was a step, and a long one, in the way of progress, and that it still continues to advance in that path in the hands of those who understand its value best, and keep its proper aims in view, notwith-

standing loud asseverations to the contrary from many quarters. It is undeniable that it is the most artistic style of garden embellishment that we can practise in our climate ; and that, had its adoption been limited in every case by considerations of fitness and harmony with contingent circumstances, we should have had little reason to complain of the vulgarity and sameness and deprivations that a too inconsiderate practice of it has entailed. Had it been better understood by all who have attempted to become professors in the art of massing, we should have heard fewer of the severe but not unmerited criticisms that have been directed against the system recently. It is of little consequence, however, that the attacks have been somewhat blindly directed against the system itself, rather than the errors that are inseparable from it under certain circumstances. But its warmest and most sensitive supporters need have little fear for the fate of their art, for it will survive every assault that is made on it from mere motives of prejudiced hostility. They will most effectively disarm and defeat the design of its assailants by casting away some of their own prejudices, and by adopting a considerable limitation of their views as to the universal fitness and adaptability of either their system itself or the materials used in it to all variety of tastes and circumstances in flower-gardening. To the credit of the leaders in the present day—those who, having the genius, and are otherwise favourably circumstanced for conceiving and developing the principles of the massing system to perfection—it may be affirmed that they cannot be accused of narrow and erroneous views respecting the fitness of that system to all cases and circumstances, and that they are ready to

admit that a large increase in the variety and hardness of the materials capable of being used in it, or in ways subordinate to it, would be a boon to all.

The almost universal adoption of the massing system, to a degree exclusive of any other possible style, has been urged often by its too enthusiastic admirers and defenders as a proof of its general applicability to the circumstances of British flower-gardens, and to the taste and genius of British flower-gardeners. Experience has, however, taught many that the exclusive adoption of "bedding-out" in their case was a mistake; that it was never adapted to either their requirements, means, or tastes; and that along with its adoption came a limitation of enjoyments. Many have come to see that a fashion in flower-gardening, unless it is expansive, and adapted to gratify the craving for flowers at all times which is inherent in every mind, is an error, and ought to be curtailed. Most possessors of gardens have for many years been accustomed to look only for flowers in the mass in summer and autumn out of doors. That such a state of things may be tolerable in some cases where the possessors, by the circumstances of society, are accustomed only to see their gardens in autumn, may be admitted—it may even be necessary in many cases to adopt such a practice; but the desire of the employer, and the means allowed, will and should always determine this. There is a very large class of gardens, however, in which the exclusive adoption of summer and autumn blooming plants is tantamount to circumscribing the interest derivable from the culture of flowers. But, apart altogether from styles of planting, and the requirements of individual cases, it is evident that any concentration of the

disposable means, space, and attention, to the culture of the flowers of a season, will have the effect of decreasing the amount of enjoyment obtainable at other seasons correspondingly. This is felt in a dreary way, and to an oppressive extent, by many who devote the greater part of their resources to the culture of summer and autumn flowers. They are accustomed to a feast of flowers for a brief period, at a season when nature herself, anywhere beyond the garden boundary, is replete with varied floral attractions—the season of all seasons, if any there be, when the flower-garden may conveniently be dispensed with. And when nature fails to lure us to her haunts, when we begin to value most highly the comforts of home and its environs, then our flower-gardens begin to fail to yield pleasure; and two long seasons, winter and spring, the latter with all its bright loveliness and sweetness in flowers greatly surpassing in power to interest and yield enjoyment the best displays we can produce, even in summer and autumn, must come and go before the fashion we have too generally adopted can again safely appear in the garden. The only remedy for the shortcomings entailed by the too exclusive use of summer and autumn flowers of a constitution fitted only to endure our climate at those seasons, is in the adoption of the hardier subjects of all seasons. I have already alluded to the extent and variety of these; and as the principal object of this work is to make the hardy perennial flowers of all seasons more familiar and popular in all classes of gardens, it may somewhat serve this purpose if I devote some portion of the space at my disposal here to a brief consideration of their capabilities for ornamental gardening, and for enlarging the enjoyments derivable from flower-

gardening. It will be convenient for clearness' sake to separate the hardy perennials, capable of being cultivated in borders without any special care or trouble, from the plants termed alpine; and the former, being the most numerous and important, may properly be first taken up.

To what extent are they capable of being used in "Bedding-out"?—The first consideration that strikes one when he passes herbaceous plants in review, in order to ascertain to what extent they are capable of being used in the style of flower-gardening most fashionable at the present time, or in any modification of it in which its essential features of massiveness, precision, and brilliancy, may be preserved, is, that only a comparatively limited number of them are possessed of the requisite qualities in such a degree as to invest them with much importance as massing plants. A good many candidates for "bedding" honours from the ranks of herbaceous plants have been put forward within the past few years; but in those cases in which the claims urged were based on the continuousness, brilliancy, and profusion of the flowers, we have heard little about them after the preliminary flourish of trumpets that heralded their introduction died away. The truth is, the number of hardy herbaceous plants that may be used in the more showy styles of "bedding-out" for the sake of their flowers only is very limited; and such as have the necessary brilliancy and duration of flowers are, by reason of incongruity of habit, unfit to mingle with the popular classes of flowering bedding plants generally. There is a large number, however, of hardy perennials, with peculiar grey, glaucous, bronze, or variegated leaves, and a considerable group of dwarf carpet-like subjects in various shades of green and other

colours; and there is another group somewhat kindred to these in the purposes to which they are adapted in the flower-garden, which is characterised by quaintness of aspect and quiet tints of foliage. Noteworthy in the first group are *Cerastium*, various *Sedums* and *Saxifrages*, the bronze-leaved *Ajuga*, the variegated form of the Shining-leaved *Arabis*, Jacob's Ladder, and Cock's-foot Grass. These, and many more of a like character, are indispensable as edging and neutral subjects in the flower-garden on the "bedding" plan. Examples of the carpet-like group are the moss-like *Saxifrages*, and many others. The Common Stonecrop and many other *Sedums*, *Leptinella scariosa*, *Acænas*, two or three, and many others of prostrate creeping habit of growth, are valuable for forming groundworks on beds or borders on which to set in relief plants that are conspicuous or remarkable either in flower or foliage, on the plan usually named "carpet planting." The last group is the least numerous, and consists chiefly in the few *Sempervivums* that are hardy, and the rosulate section of the *Saxifrages*; but so far as they go, they are worthy subjects to use in connection with masses of colour, either in the form of edgings—though in that way their quaint style may be proper only in rare cases—or in beds by themselves, either isolated or connected with colour.

A small number of herbaceous plants—or if not all strictly herbaceous, usually, in gardens at least, classed with them—may be used in connection with "bedding-out" with the best results, as central and outstanding objects for the purpose of breaking flat surfaces, and relieving with gracefulness or rigidity of form dense and extensive masses of colour. The various hardy *Yuccas*,

large-growing Grasses, Bocconia, and Veratrums, are some of the subjects of this class.

Their capabilities for Spring Flower-gardening.—It may, I think, safely be affirmed that the flowers of spring are at once the most chaste and brilliant in colour, the most sweet and attractive, of those of all other seasons. It may be that the comparatively dreary circumstances under which they appear has by contrast the effect of heightening their beauty and worth. While Flora's other subjects are yet unstirred, these, her hardy children of spring, come forth in the short dark days, almost forbidden by nature's rude influences, bringing with them a renewal of precious promises, and fresh hopes and thoughts pleasant to ponder, but often unutterable. Spring-flowering perennials, whether of the fibrous-rooted or bulbous kinds, are exceedingly numerous, and abound in varied and bright tints, and the majority are very profuse, and many are deliciously fragrant. The summer and autumn flowers that deck the parterre in the fashionable flower-garden may be pointed to with some exultation by the "bedding" gardener as the perfection of brilliancy, denseness, and duration in flowers; but they cannot compare with the flowers of spring for individuality, sprightliness, delicacy, and simple grace.

The great defect long ago felt in "bedding-out" is the sharply-defined and comparatively brief period during which it is possible to enjoy it in this climate. This is inseparable from it, so long as the main or any considerable portion of the materials used in it is of too tender a nature to endure the low temperature and variable weather that prevail during spring, and even in early summer, in many parts of the country. Where families

reside the year round at their country seats, and to the very large classes of owners of suburban villas, amateurs generally, and cottagers, this alternate feast and famine of Flora, consequent on the too exclusive culture of summer-flowering plants, is becoming unendurable. A very large number of brilliant spring-flowering perennial plants of the simplest cultural requirements are capable of being used for garden embellishment in the same way as that which is fashionable in the summer flower-garden, or in mixed fashion. In a few places in the country, by a skilful use of spring-flowering perennial plants and annuals, that comparatively recent style of flower-gardening called "spring massing" has been introduced with the best results; and there is no doubt but that, on some scale suited to the requirements of individual cases, the reintroduction of the beautiful flowers of spring into our gardens would be a boon to all. The wonder is that they have not been called back long ago. In most gardens we are accustomed to see a few Snowdrops, Crocuses, and it may be a few Winter Aconites, but they are generally few and solitary enough, reminding us of the desirability of flowers in spring of all seasons of the year, and making us yearn for summer when their abundance is greater and less enjoyable. The beds and borders of the smaller gardens should be filled with at least all the spring-flowering bulbs in an orderly way, whatever may be the nature of their summer occupants; and there are many fibrous-rooted perennials which may be used in conjunction with these as temporary ornaments, such as Primroses, Daisies, Ajuga, Iberis, and others included and described in this work, which will bear frequent removals without injury, and may there-

fore be removed in order to make way for summer flowers on the massing system. Spring flower-gardening may be attempted in two ways—in that just slightly alluded to, which may be called the migratory system, and in which the practice is to fill up the summer flower-garden in autumn, when its characteristic occupants fail, with spring-flowering, perennial, and annual, and variegated plants previously prepared for the end in view in a reserve garden or borders during the summer, to which, if perennial, they are taken back when it is necessary to prepare for the summer campaign. The best recommendation of this system is, that it provides furniture for the summer flower-garden at all seasons, but it is attended with greater cost in labour and material than the other practice of setting apart a convenient space to be permanently occupied by spring flowers, and called the “spring garden.” In this permanent garden there may be cultivated many valuable spring flowers that are constitutionally averse to frequent removals and disturbance, and consequently unable to stand the wear and tear attendant on the other plan, along with many others as charming as any, but so slow of increase by any means as to be ever at a minimum in point of numbers. The practice of spring gardening is yet in its infancy, however, but with the wealth of brilliant material available for it in one way or another, great things may be expected of it; and as much of the material is comparatively inexpensive and of the easiest culture, and must of necessity be hardy, the practice of it is rendered much more generally possible to all classes than summer flower-gardening on any system with plants of tender constitution. In any case, a general reintroduction of hardy spring flowers

cannot fail to extend the enjoyments of the owners of gardens, and remove the too well grounded complaint so frequently urged at present of a brief repletion and lengthened barrenness of beauty in the flower-garden.

Their Value in Mixed Borders.—Although it is no part of the object of this book either to recommend or condemn styles of planting, it may not be amiss here to advert slightly to some of the advantages that may be gained in any garden, large or small, by the adoption of the mixed system to a greater or less extent. The advantages of this system will be limited or extended just as the materials used in it are numerous and varied, or the reverse. It would certainly be no improvement on the massing system, were it carried out by means of the same plants used in it. But the mixed style admits of the employment of any judicious amount of variety both of colour and form, and every feature that constitutes individuality in plants, and the flowers of all seasons are indispensable also in the practice of it. Thus spring, summer, and autumn flower-gardening may be carried on in the same place; and the largest number of the subjects being both hardy and of perennial duration, an extended enjoyment of flowers may be obtained at very little increase of labour and cost, even where it may be adopted as an adjunct to the massing system, or in any other way, as a relieving feature or department in the same establishment. In other cases where the strain and demands made on indoor departments and labour by the expensive routine of “bedding-out” are felt to be oppressive, some curtailment of the extent of the massing system might be made without any decrease in the interest of the flower-garden, but rather the reverse, by the

introduction of the mixed style to such an extent as the circumstances may suggest. Cases of this kind are very numerous. Indeed it may safely be assumed of the majority of the gardens in this country, that the extent of "bedding-out" carried on in them is done under difficulty more or less, and to some extent in many cases to the prejudice or loss of other departments. The reason in most instances is, that the practice of the fashionable style of massing has greatly exceeded the elasticity of the resources and appliances allowed in the shape of glass accommodation and labour. It is obvious, therefore, that a resort to the mixed system, which may be carried on very effectively with hardy subjects, perennials and annuals combined, would be an advantage to the owner, and no less so to the gardener. Possibly the much more numerous class of smaller gardens, whether about town or country, in which there are little or no appliances and means for producing the annual supplies of bedding plants, would benefit most by the adoption of the mixed style of planting. In these, adequate selections of hardy perennials are generally as rare as in those that are better provided with the requisite resources for "bedding-out," and they are consequently dependent for their supplies on the nurseryman or their more favoured neighbours, according to circumstances, and the result is, as can only be expected, unsatisfactory at all points. The mixed border, or the principle of it in either beds or borders with a broad groundwork of hardy herbaceous plants, selected with a view to general effect throughout the year, among which might be worked in such annuals and bedding plants as may be available or desirable, would enhance the enjoyments of the possessors of such

gardens, and be a considerable improvement in point of taste on the starved examples of the massing style that is too often observable in them. There are gardens of all kinds, many of them, perhaps, with means and resources abundant enough to meet all desirable demands in connection with the massing system, situate in cold late districts in the north, and not altogether solitary in the south where "bedding-out" cannot be called summer gardening at all—where the design in the flower-garden is no sooner begun to make itself intelligible and enjoyable than it is cut off. That is carrying the summer fashion of the massing style into the domain of winter, of course, where it cannot but come to grief; and if flowers are to be enjoyed out of doors in such gardens, they must be sought for in selections of hardier subjects, and the style of planting, if it must be altered by the adoption of these, will surely lead to a more gratifying result to all concerned.

Perhaps not the least advantage that would accrue from the introduction of the mixed style of planting, and along with it more or less extensive collections of hardy perennials into every garden where the circumstances are favourable, is the educational value that exists in the possession of many and varied objects for the exercise of the mind. The opportunities for the exercise of taste afforded in the arrangement of a miscellaneous collection of plants of distinct and varied forms, stature, and colour, are not inferior to those offered in the massing system with more limited and same materials. The distinct and broad features of art that are characteristic of the latter may be wanting in the former, but that is no proof that art cannot be exercised in the production of less striking, though not

necessarily on that account less beautiful, details. The principles involved in the practice of the massing system are not different from those that should guide the artist in the mixed style. The materials are different, and the aims and modes distinct, in both styles; but colour, stature, and general fitness and congruity, must be regarded with equal care in the one as in the other, if taste and beauty are to be exemplified in either. And there is this superiority in the mixed style over the massing, that the individuality of the plants is not altogether swallowed up in the general effect. This is no small matter if we are to regard our gardens and flowers as means that may be turned to valuable account in expanding the mind and drawing out the higher feelings of our natures. Colour, as one of its uses, was possibly stamped on flowers to invite us to a closer pondering of their inner mysteries; and if so, we are somewhat prone—we gardeners, at least—to disregard its lurings, and to look upon it as the only worshipful quality in flowers. The habits of exact observation which are acquired in the study of the structure and classification of plants cannot fail to be useful to every one; and young gardeners in particular, whose duties in after-life will make large demands on such habits, should, for that if for no higher motive, exercise their faculties in that way a little more assiduously than is their wont generally at the present time.

Remarks on the Arrangement of Mixed Borders.—It is not easy, if it is even possible, to put on paper instructions for planting a mixed border on a definite plan. It has been often attempted, but the result has always been more or less vague. There are too many details

involved in the matter to admit of its being made intelligible or clear on paper. It is more desirable to be thoroughly conversant with the points essential to be observed, in order to produce a beautiful whole, rich in variety throughout, than to be provided with plans on paper for this or any other style of planting. Perhaps the first and most important point—to all the smaller classes of gardens it will be so, at least—to keep in view in the planting of a mixed border is, that it should be so arranged, and composed of such materials, as to be more or less replete with interest at all points at all times, if not in flowers, at least in foliage and in diversity of individual aspect. In order to be able to bring about this result, the planter must have an intimate knowledge of the height, colour, habit, and aspect at all seasons, and the time of flowering, and the duration of the flowers, of the different subjects to be planted. Skill and taste in grouping must do the rest. It should be remembered that freedom and grace ought to have prominent consideration in mixed borders, and that along with these there must be order; the plants being graduated easily and gracefully from front to back. Rigid lines, however, as in geometric planting in the massing system, should always be avoided; but it will be necessary to consider the bearings of the contiguous subjects at any given point both on each other and upon the whole, especially when space is limited. Monotonous and frequent repetitions of the same effect are undesirable. Harmony of colour and harmony of form, and agreeable contrasts of both, are of equal importance in mixed planting as in massing. An outrage of the one or the other may be more easily

discernible in the latter style than in the former, but if often repeated it will have the same bad effect, although the cause may not be always easily defined. Although the object of this book is to bring about a more frequent use of hardy perennials in garden embellishment, I do not think it is desirable to recommend their exclusive use in even mixed planting, for which style they are better fitted than for any other. It would be a difficult matter to make a selection of hardy perennials capable of keeping up a sustained interest all the year round; and such a selection, when made, would probably present too little individuality or variety to be valuable in any but small gardens, or for any but limited or specific effects. But supposing it were otherwise, it would not be desirable in all cases, for it would not meet all the ends for which flowers are, or should be, cultivated, and would lead to many of the limitations of enjoyments obtainable therefrom that are complained of in the exclusive practice of the massing system. Good annuals and bedding plants are invaluable materials in the arrangement of mixed borders for effect; but hardy perennials—especially such as flower in spring and in late autumn—ought to form the groundwork of such arrangements, and the others, according to desire or necessity, should be regarded as temporary and subordinate aids to the end in view. Spring-flowering plants, owing to their usually low stature, are planted at the front of mixed borders as a rule; and in so far as concerns many of the fibrous-rooted evergreen and deciduous species, the practice is right, and consistent with order. But with regard to spring-flowering bulbs, there does not appear to me to be any reason why they should be

crowded to the front of borders in the same way. Their foliage is in the way for only a short period of the season, and may often be removed earlier than it is without injury to the plants. The advantages that would be obtained, therefore, by planting them in the spaces between the summer-flowering plants all over the border are very obvious; the fringy and irregular appearance in spring that results from the practice of crowding the flowers of that period to the front of the border would be done away with, and every part of the surface unoccupied with dormant plants might be as richly varied and beautiful then as at any other period. In connection with this I would draw the attention of readers to the value of the spring-flowering hardy annuals, especially those commonly known as "Californian." They are indispensable for spring-gardening, and those inquiring after them will find much valuable information in a cheap little work on annuals by Mr Thompson, seedsman, Ipswich, one of our best authorities on such matters. The title of the book is, 'The Gardening-Book of Annuals.' Much might be done, also, to render mixed borders beautiful, not only in spring but all the year over, by adopting the "carpeting" practice that has made some favour for itself in connection with the massing system. Looked at correctly, this practice is mixed planting, not massing; and it cannot, of course, be done without obliterating the essential features of the massing style. It appears to me to be a very desirable practice to introduce generally into mixed borders; and the abundance of hardy evergreen trailing or creeping plants, and others of various tones and variegations of foliage that are to be

found available for the purpose, renders the adoption of the practice, in so far as the procuring of materials is concerned, easy. The bright beauty of spring flowers rising in relief from a carpet, say, of the moss-like Saxifrage, or the still more compact, and in many soils not less verdant, *Spergula pilifera*, would be more enjoyable on account of the cheerful contrast than when springing from and often bedraggled with the soil. There would be no more difficulty in keeping a border so carpeted than there is in the ordinary way, and there would be no increase of labour; perhaps it would even be somewhat diminished. To many mountain-pasture plants, carpeting the surface in the way indicated would be a real boon. Many of these plants die in cultivation from too much exposure to the sun, and the variable condition of the surface caused by the scrupulous cleanliness which should prevail in gardens in order to make them enjoyable. With diminutive species that are easily overborne by their neighbours, such a plan is not practicable; but there are very few of these that would be of much value as ornaments in the mixed border in any way, for generally they are as difficult to keep in the usual way as they would be in the other, and are therefore, in either case, better and safer in some place by themselves, on rockwork or in pots.

General Culture of Herbaceous Plants.—The mass of herbaceous plants, being found in varieties of alluvial soil, may be grown successfully in the ordinary soil of gardens, or in such as general field and garden cultivation may be practised with success. Depth and the mechanical condition of the soil is of much more importance than the chemical composition to the great

majority of hardy perennials, and it is to those two points that attention should be mainly directed when preparations are being entered upon for their culture. The ground should be trenched deeply if it will admit of it, and if not, as much should be done as is possible under the circumstances to add to the depth. If the ground is thin and gravelly—and these two conditions very generally accompany each other—good loam or clay should be added to the fullest extent practicable, incorporating carefully the new with the old soil in the process of working it. In soils of this sort, herbage of a luxuriant and valuable kind does not exist in nature, nor can it reasonably be expected to do so in cultivation; and as we should aim at the best results in this as in all kinds of work, it is well to bear in mind that they are only attainable by the employment of the best means and judgment. It may be stated as generally applicable to the mass of hardy perennials, and especially so to the more showy and valuable ones, that they grow badly, and flower both ill and briefly, in thin dry soil, and hence the necessity for improvement before attempting their culture in it, if of that character. If, on the other hand, the soil is deep and moist to wetness, there may be excessive luxuriance produced thereby in some species, but very many of the more valuable ones will be injured rather than improved. Many of our best border perennials die in such soil during winter; they do not ripen well, and their tissues being soft and usually unduly charged with moisture, they suffer more severely from ground frost, which penetrates to a greater depth in moist than in comparatively dry earth. Thorough drainage and improvement mechanically by the addi-

tion of grit of any sort to the necessary extent, or charging the earth itself, if practicable, are the obvious corrections; but efficient drainage ought to be first attended to in such cases. In preparing a new site for the cultivation of hardy perennials, it may not be necessary, if the soil is naturally rich, to add anything of a manurial kind in the process; but in renewing old borders that have been long occupied by such plants, it will always be necessary to improve its condition to some extent by adding manure. Any tolerably well decomposed manure is suitable, but a renewal of the earth is, if practicable, even more desirable. In any case, the soil of old borders should be well trenched, and thoroughly pulverised and mixed.

The proper time to plant herbaceous perennials depends on a variety of circumstances, but principally on the constitution of the plants themselves, and the nature of the soil and climate of the locality. The directions as to the time for division given in the descriptive part of this work under each subject are equally applicable as to the time for planting, and it will be safe to follow these directions as far as possible. Generally speaking, however, the mass of vigorous-growing perennials may be planted at any time after growth is nearly matured; and with skill and extra precautions, many that may be lifted with balls can be transplanted at any time short of or soon after the period of their greatest activity, if circumstances should render such a step necessary. Many bulbs, if carefully lifted and the balls preserved, may be so managed even when in full flower, but such a course is not advisable nor often necessary; but the knowledge that it is prac-

ticable may be useful to those of small experience in such matters, when placed in circumstances calling on them to make alterations after growth is more or less active, in which the destruction or preservation of useful subjects is involved.

The summer management of mixed borders does not involve many details. The vigorous-growing species, such as Delphiniums, Lupins, Pentstemons, autumnal Phloxes, and all of like luxuriant habit, are improved in the first bloom by having a moderate proportion of their stems thinned out early in the season ; and there is often a second bloom induced thereby, not very considerable, perhaps, but it may be very opportune and welcome nevertheless. In any case, the flowering improves and is prolonged by thinning judiciously. Timous attention must be given to staking and training, else the usual consequences, in the form of tossed and tumbled plants, a general appearance of untidiness, with brief and worthless blooming, will ensue. The habit of the plant should be taken into account carefully when the supports are being applied to it, and, as far as circumstances will admit, its peculiarities should not be interfered with, except in the direction of improvement. The ordinary tight lumping up of all subjects to one stake in the same ungainly fashion, so often observed in mixed borders, is very objectionable ; the only ground on which it can be excused in any case is, that the labour exceeds the capability of the force so much that any better or more tasteful practice cannot be attempted. But surely a little curtailment of extent, coupled with a little mechanical contrivance, would help to eke out the deficiency in two ways, and bring about a more pleasing

state of things. A little curtailment in extent need not mean curtailment of species, for in most collections there are too many duplicates of sorts that it would be no great hardship to part with, and it would conduce to a greater concentration of the disposable time and attention; and in these days of cheap wire and invention, almost invisible supports may be had, so contrived as to make no greater demand on the labour in the case of a large number of plants than that required in the setting of them up in a proper position, and there would thus be a considerable saving of time in tying, over and above the improvement in point of taste and orderliness, and other considerations bearing on these. Cleanliness—that is, freedom from weeds, and the timely removal of decaying foliage and flowers and the seedy parts of plants—should have constant attention throughout the season. A constant eye should be kept on the weakly and rare subjects in the collection during spring, summer, and autumn, in order to anticipate disaster and loss, and as far as possible provide against it.

The winter management of mixed borders is even more simple than that of summer. If the border has a groundwork of carpeting plants all over it, digging is happily impossible; and if not, it is objectionable. Supposing that the operation of digging could always be engaged in with safety to minute plants and bulbs, by the hands to which that work is usually committed, it is otherwise undesirable and unnecessary. Labels may serve as a protection to all plants that are unseen on the surface, if they are in the right place, but there is not always a warrant for that assumption; and even if they were always in the proper position, indiscriminate digging of

the surface is not a very commendable practice. In a well-filled border there should not be much room to use the spade between the plants, except among the grosser and more vigorous subjects of the back line or two in wide borders; and the practice of digging among the closer planted and less vigorous ones of the front lines can be of no possible use but that of cutting up their roots, which, if desirable at all, should certainly be conducted with some judgment and selection, not wholesale and indiscriminately. If there is any necessity for curtailing the vigour and rampant encroachments of individual species or varieties, by all means let it be done by direct assault on their own persons, but spare their weaker neighbours. There are many vigorous encroaching species, which it will be a benefit to the border generally to lift and replant annually; the operator, however, always using his judgment as to when and to what extent the necessary crippling should be administered. In spaces left for the filling in of temporary occupants in summer, the spade may be used during winter in the interests of these occupants; but for no other purpose than this, and that of reducing the vigour of overgrown plants, should it be employed in the mixed border annually. A dressing of any light well-made compost, such as garden refuse, if it is not teeming with the legacies of seeding weeds, or leaf-mould and maiden loam in about equal proportions, may be annually applied to the surface during early winter, any time before that in which the earliest spring flowers begin to throw up. Winter being the period most suitable for effecting any changes that may be desirable in the position of the components, no favourable opportunity should be allowed to pass by

without being taken advantage of, except the changes contemplated affect any of the classes exempted from operations of the kind, before spring with a little growth and warmth sets in.

It is a very common thing to leave a herbaceous border to itself—that is, undisturbed—for many years after it is planted. That is not cultivation, but letting well alone till it is no longer well. It is not a desirable thing to have to overhaul a collection of miscellaneous plants out of doors, with all its attendant discomforts at an inclement season ; and it is equally undesirable to anticipate and bear the vexation consequent on the losses that often inevitably follow such a step. But it must be done occasionally, fortunately not very often in a lifetime if the soil is naturally good and the annual culture liberal. The necessity for renewing a border occupied by mixed herbaceous plants must be judged of by the circumstances of the case. It is impossible to set down any rule for such a matter ; but when the usual unmistakable signs of debility—a falling off in luxuriance, and general effectiveness both in the profusion and duration of the flowers, with an apparently unaccountable death of one or more favourites—it is time to set about renewing the border. The necessity should be foreseen sufficiently long to be prepared for, by securing all diminutive and delicate subjects before winter sets in, either in pots in a cold frame, or merely laid into it in a little soil, where they will be safe for the winter. When the operation is begun, the stock left in the border should be lifted, and laid carefully in in some spot convenient to the border, taking care of the labels, if the collection is an extensive one ; for the memory will fail one occasionally, and is

the better of the assistance of these helps. The border should then be trenched, and enriched moderately with some well-decomposed manure ; and any mechanical improvements necessary besides that of trenching should be attended to in the process. The soil should be allowed to consolidate a little before the replanting takes place, but should not be delayed longer than is necessary—only the delicate and small things may be left under protection till spring. It may not be too unimportant for those who have the means for availing themselves of it, to say that a comfortable snuggerly in the shape of a little rockwork or small reserve corner, with duplicates of the more valuable kinds always kept in stock in it, would save much annoyance and some expense at all times, and especially when a general renovation becomes necessary.

General Culture of Alpine Plants.—The culture of the plants of the higher alpine and northern regions of the earth has always been attended with some difficulty in this country, and will no doubt continue to be so as long as our climate is insular, and so favourably influenced by the Gulf Stream. Thanks to coal and glass, we can provide suitable homes for the vegetable inhabitants of every country that is distinguished by a higher temperature than our own ; and thanks chiefly to the influence of the Gulf Stream, we enjoy in the open air in perfection the valuable fruits and flowers of sunnier lands, and to a certain extent also we may cultivate the rare and simple flowers of those that are more frigid ; but in this direction, the peculiar conditions of climate that give us such an extensive range of benefits, raise up obstacles over which any means in our power exerts but slight and imperfect

control. We are told by some authorities on alpine plants, that the failures so commonly experienced in their culture are due to the use of improper soils, mistaken methods of management, and faultily-constructed rock-work. There is some truth in this conclusion in some cases, perhaps, but they are few that can be satisfactorily explained on these grounds. The more important and less controllable influences of a peculiar climate, to which such mere terrestrial conditions are quite subordinate, are either overlooked or ignored in that view of the case. It has been generally admitted by the cultivators of alpine plants, that the difficulties they have had to contend with in the case of the more unmanageable species were atmospheric, not terrestrial, and that their requirements in the latter respect are the most simple and least liable to be misunderstood of all classes of cultivated plants ; and this view has the merit of harmony with the natural laws which govern the distribution of plants on the earth, as well as with the teachings of experience gathered from the failures and successes which attend the cultivation of plants from all climates. The terrestrial conditions under which they exist in their own wild homes are not uncommon in other regions, and occur pretty frequently in our own land. The beetling crags, moist rocky chasms and fissures, and stony wastes of the Alps, are repeated again and again, in every latitude and at every elevation ; but the gems of the alpine flora do not bedeck them everywhere. And the soil of the alpine regions is the simplest of all soils : it is the ground and battered fragments of the rocks which form the base of all alluvial earth, and is not peculiar to the Alps, but may be found at the lowest elevations, in as simple a

condition as at the loftiest summit ; yet alpine plants do not occupy it at other than the highest and most northern limits of vegetable life. We have all these, however, in very fair perfection on our own mountains, and a little elevation added to the highest of them would give us an alpine or arctic climate to boot. But with all this, extremely few of the types of alpine plants that are peculiar to the highest positions on the Alps occur in the flora of Britain ; and it is remarkable of these few species that, while they are solitary or exceptional in their occurrence in Britain, they enjoy a wide and liberal distribution in the higher alpine and arctic regions. It does not appear, therefore, that the circumstances of congenial soil and elevation are all that these plants require in our climate. Perhaps the long winter's rest under their snowy covering, extending to from six to nine months—and sometimes, by reason of a low summer temperature succeeding an unusually severe winter, they are even locked up from the light for two years on end—is what they miss most in our climate. They are called on to endure in one year, in the climate of Britain, an amount of excitement that would be spread over several years of their existence in their native habitats ; and this, sustained year after year, cannot but end in debility and utter exhaustion sooner or later. Good culture and careful management will do much to obviate and ward off the fatal end for a time ; but the often-repeated failures in the past, with many of the more delicate and rare of these gems of the high Alps, will not be exceptional, it is to be feared, in the experience of all who attempt their culture in Britain in the future. But this consideration should not deter any who have the

essential love and enthusiasm for flowers necessary to engaging in the culture of these coy beauties from making the attempt : they are worth fondling once or twice in a lifetime, even at considerable pains and cost.

These more difficult to manage alpine plants, along with other subjects not alpine, but which require peculiar treatment though hardy, such as Worm-grass, are usually cultivated in pots and pits devoted to themselves ; and while stock is limited, it is the safest and most successful way to manage them. But rockwork is unquestionably the most characteristic and interesting home for such plants ; and if well constructed—that is, if so made as to provide that perfection of drainage which is essential to alpiners generally, along with good means to supply moisture abundantly, but at will and always under control—the terrestrial circumstances are superior to those they are under in pots ; and the nearest approach, indeed, to their circumstances in nature that we can possibly make, is thereby attained.

The selection of a site for rockwork involves considerations of taste and fitness for the object in view. Whenever natural rockwork occurs in the scenery of a garden or pleasure-grounds, it may be assumed that a little preparation by the introduction of soil and water, if not already provided for by natural circumstances, is all that will be required of art to make it fit for the reception of alpine plants. If, however, the rock should be subject to drip or continual moisture at all seasons, it is not well adapted to the culture of these plants in this country. They will bear as much moisture in the growing season as can well be supplied, if the drainage is sufficiently perfect to prevent stagnation ; but when autumn and

winter come on, constant moisture at the roots, added to the natural humidity of the atmosphere, is very injurious to them. In the frigid regions they inhabit, the approach of winter brings rapid and constant congelation of the moisture both of the earth and the atmosphere, and the plants are immediately brought to rest, and remain, for a period always longer than the duration of our winter, in a state of dormancy almost as complete in its arrestment of functional activity as death itself. This completeness of rest can never be secured to them in cultivation ; but the nearer we attain to it the greater will be the success. The drainage of the rockwork, whether natural or artificial, is therefore of the first importance ; and the best means devisable in the circumstances should be adopted to cut off or control the percolation of moisture in natural rock during winter, when in nearly every case it is liable to increase rather than diminish. For if abundantly supplied with moisture, these plants, peculiarly sensitive as they are to every alternation of temperature, will now be tortured into abortive and exhausting attempts at growth, and again suddenly become ice-bound, many times in our comparatively short but variable winter. In choosing a site for an artificial rockwork, low, humid, shady situations should, for the reasons just stated, be avoided. A free airy position is the best, and it should, of course, be harmonious with the surroundings—natural, not artificial, features ought to prevail around it ; and the design or fashion of it, and the extent, should be regulated by sound views as to what is natural and tasteful—fancifulness being easily detected and always objectionable in such matters—and by the idea of breadth which the scene

in which it is to be placed suggests to the mind, as well as by the means at disposal both for construction and after-furnishing and keeping. The materials required are earth and stones, and of the two the first is the most important. Very few alpine plants, be they ever so tiny, can subsist on impenetrable rock,—they like to cling to it if it is surrounded by or contains in its fissures sufficient soil and moisture to support them ; but, in forming an artificial home for them, the principal use of stone is to provide drainage and give character to the design. The stone used should be porous. Generally speaking, stratified rock is best, and the rougher the grit the better ; but granite and the like is quite fit for the purpose. The soil, as before said, is most important, and should be composed of peat and loam, and a very large proportion of sand and gritty matter. Such a compost will be congenial to the majority of alpiners, and the few that require peculiar soil must be provided for specially in the positions they are to occupy. The mass of the erection should be composed of the compost mingled with small angular stones in order to keep it open, and the larger stones be disposed of by being buried to a greater or less depth on the surface in a natural manner. The large stones may be placed wide apart or closely, and there should be as much diversity in this respect, and in the various heights to which they rise above the surface, as will secure every variety of position for the plants. Some will be found to require partial shade, and should therefore be planted at the base of the more towering rocks. Some prefer hugging the rocks with their roots, and should find a place in the narrowest fissures. Others, and they are the largest number, suc-

ceed best in the wider spaces, where they may have the means of extending their stems in all directions. Water may easily be introduced into rockwork by means of lead or copper pipes being brought to the surface through the mass ; and a small perforation made at desirable or necessary points at the highest elevations will amply provide for the complete irrigation of the mass, wherever and whenever it is wanted. The pipes should be furnished with a cock or valve at some conveniently approachable point, for the purpose of regulating and thoroughly controlling the supply at all times. These simple directions will enable those who desire a little rockery to construct it on good principles. Extensive rockworks or rock-gardens will always be rare on account of their cost ; for under the most favourable circumstances, the materials and the labour necessary to their construction are among the most expensive that are required in any form of garden engineering, and those contemplating anything grand in this way will choose more comprehensive guides on the subject than this little work professes to be. It should be stated, before leaving this matter, that the smaller the rockwork in area of base, the more humble should be its elevation. Not only is any attempt at undue prominence not beautiful, but it is likely to frustrate the object for which any rockwork is designed—namely, the successful culture of alpine or rock plants. High and narrow erections of the kind are more liable to suffer from drought than those whose base stands in better proportion to the elevation ; they are, in fact, more liable to every alternation of heat, cold, and drought—and that of all things is to be avoided as much as possible in the management of alpine plants. They

are capable of enduring great extremes of heat and cold, but will not bear often-repeated alternations of either for long during their rest period. Rockwork formed on the face of a slope or bank may be raised as high as correct taste and convenience will allow, because its position will protect it more or less from the evils hinted at above, and has the effect of disguising the disproportion that exists between the base and elevation. But if it rises from level ground, the elevation of the mass or solid portion will be more beautiful as well as more useful if it is humble.

The arrangement of the plants will be determined to some extent by the requirements of the different subjects as regards sunshine, shade, and moisture ; but in any case it ought to be natural, and as far as possible without design, other than that of producing a beautifully-varied and pleasing whole, in which grace of form and colour should freely mingle, the one helping out the effect of the other. As a rule, the larger and more robust subjects should occupy the more elevated, exposed, and distant positions ; and the smaller and more delicate ones, those that are nearer the eye, where their less ostentatious attractions may be fully enjoyed.

The after-management of the plants is simple enough, but entails constant attention. Their peculiar habits must be studied and fostered by every means in the case of the weakly and diminutive, and restrained within due bounds in the case of the strong and encroaching. The enemies of small and delicate species, in the shape of slugs, wire-worms, and earth-worms, are numerous and active during spring and early summer, and have to be constantly watched and destroyed. Nothing is better than hand-picking in the case of the slug ; and the even-

ing or the early morning, when they are out for a browse, is the best time to look out for them. Wire-worms may be caught by burying pieces of fresh-cut carrot or potato in the ground in their haunts, fixing in each piece a small stick, both to mark its place and aid in the daily examination that should be made of their under surface for the prey. Earth-worms may be treated liberally to clear lime-water, which usually brings them to the surface, when they may be gathered up and destroyed. The worst evil they bring upon alpine plants where they abound is that of destroying the desirable mechanical condition of the soil ; and in the case of very small subjects they occasionally unearth them altogether, or earth them too much by piling up their casts about their tiny growth. The presence of earth-worms to an inconvenient extent in rockwork, however, is a sign that the soil is too rich, and not sufficiently abundant in sharp grit, and the best remedy would therefore be renewal. Due attention should of course be given to weeds, and the removal of all that is unsightly or undesirable. Water in abundance is of the utmost importance ; and whether it is supplied by the hand or by means of the pipes mentioned above, it should be without stint, but carefully applied, aiming at wetting the soil always, not the plants, and avoiding dashing and splashing, which are very injurious to small and delicate species. As autumn and winter approach, and the majority of species will have made and finished growth, it is necessary to withhold water by degrees, and wholly before winter finally sets in. Everything should be done to induce early and complete rest, and this is best accomplished by drawing off the supplies of moisture betimes. There is consider-

able difficulty experienced both out of doors and in frames in keeping the silky-leaved *Androsaces*, and all which like them have their leaves densely clothed with down. They damp away to an alarming extent, often while the utmost care is exercised in their treatment. A dry airy position, along with the assiduous removal of the damping parts, are the only preventive and cure available. In low damp localities it will be necessary to remove in winter to the protection of a dry airy frame or pit all delicate subjects that there is any reason to have anxiety for if left out of doors.

Those who have no rockwork, and yet wish to cultivate a few choice alpine flowers, may do so very successfully in pots. Indeed, in very humid localities, it is often the only practicable way of keeping them. Pits are not absolutely necessary except in wet places when they are grown in pots, though it is desirable to have them if required. Their culture in pots is very interesting, and brings the cultivator into more direct intimacy with his subjects than when they are spread more promiscuously and in greater independence over rockwork, and it admits of a better adaptation of the means, such as soil and moisture, to individual requirements. As an offset to these advantages, however, it must be acknowledged that it is the most troublesome manner, but that will not weigh heavily with those who have the requisite enthusiasm, and are in circumstances favourable to gratifying it. Generally speaking, the soil recommended for the rockwork is also suitable for the plants in pots, but even more gritty matter may be used with advantage in pot culture. The same general observations with regard to drainage and moisture apply with equal

force to the one case as to the other. A dry light position should be selected for the pit or bed in which the pots are to be kept. The pit should be shallow and narrow, about 4 feet wide, and be provided with a concrete bottom, so as to prevent worms taking possession of the plunging material, and thence finding their way into the pots, and a good drain should pass along the bottom. Various plunging materials may be used, but the best are gritty clean river or pit sand and sifted coal-ashes ; the former is best, being cleanest and most easily worked, and, from its lighter colour, is not so apt to cause scorching under bright sunshine. The pots should be plunged to the rims, and in plunging it is advisable to put such as require any peculiarity of treatment, such as a little shading, by themselves, so as to simplify the means and management. The winter management of the pit consists in keeping it freely aired at all times—the lights, in fact, should never be put on but for the purpose of excluding rain and snow ; in keeping a constant watch for and removing all damping portions ; and in keeping up a state of general cleanliness and comfort. In summer and autumn the lights may be put on according to circumstances, for the exclusion of heavy rains in protracted wet weather ; but air should be freely admitted at all times by lifting the lights at the highest part if they cannot be taken off.

If only a bed in the open air can be afforded for cultivating alpine flowers in pots, the cultivator may find it necessary on experience to forego certain of the more unmanageable species which are peculiarly liable to damping off in winter ; but many beautiful and choice species may be successfully cultivated in that way. For

convenience' sake the bed should not exceed 4 feet wide; the bottom should be well drained, and the most effective means for excluding worms from the plunging material and pots must be adopted. A depth of 6 or 8 inches of sifted cinders, the fine being rejected, will be found very effective for this purpose, and a heavy roller passed over it after it is laid in will aid still further in the same object. The sides of the bed may be formed of slate, bricks on end, or boards, but they must be carried down a little below the bottoming of cinders, else the enemy will find out the breach and avail himself of it. In plunging the pots, it will be found an advantage in the after-management if the same advice is followed in the open-air bed as is given above respecting species requiring peculiar treatment in the pit.

The potting of alpine plants is best done in spring when growth is starting, if in the operation any breaking down of the ball is to be involved; but if it is simple shifting from a smaller to a larger pot, it may be done any time while growth is active, not however so safely when the plants are at rest, except in the case of the more vigorous species. Pots of the ordinary form, if well drained, will be found suitable for the majority of alpine plants; but many—as for instance, *Saxifraga oppositifolia*—are best grown in pans not so shallow as the ordinary seed-pan, but having the diameter of large pots, along with less depth. These pans give greater scope for the natural extension of such species, and therefore a more desirable exhibition of its character than can be obtained in an ordinary pot. Those species that are liable to damping should be held high in the soil, and the surface, up to the collar of the plant, be

covered with small angular stones: by this means less humidity will rest about the plant, and, in so far as the stones will arrest evaporation, there will be a limitation of the necessary watering; so that in two directions the cause of damping in those subjects is lessened by means of this practice.

A large number of alpine plants may be cultivated in the mixed border, if the locality is not very moist, and the drainage good. Only the more vigorous should be tried out in this way by the inexperienced at first, and the more fastidious and delicate by-and-by, when stock and experience are both increased sufficiently to warrant a few experiments and their risks. Nearly all will be benefited by being a little elevated above the general surface, mound-like, and most will be the better for having a few rough stones buried or half buried about their roots, in soils that are inclined to retentiveness; while in those that are light and dry, most alpine should have the surface in their vicinity covered with stones to prevent evaporation to an excessive degree. Those stones, whether buried or on the surface, serve another good purpose besides those of drainage and retention of moisture: they keep up a more equable temperature in the soil, which is a point of much importance in the culture of alpine plants.

The time when alpine plants may be most safely divided is spring, when a little activity is beginning. There are many vigorous sorts that may be operated on with safety in the autumn, but in the case of all small and surface-rooting species it is better to wait till spring. Those which make a very early start into flower, such as *Anemone apennina*, may be divided in early autumn; and any

that are then divided should be attended to early, as soon as the first symptoms of going to rest are apparent.

Rearing Herbaceous and Alpine Perennials from Seed.—In the descriptive part of the book I have in all cases requiring special treatment given the necessary details for rearing the subjects from seed, and here I propose setting down a few suggestions applicable generally to the sowing and rearing of the two classes of herbaceous and alpine perennials for the guidance of amateurs and others of limited experience. The mass of these hardy plants—perhaps I should say all—may be raised from seed in the open air more or less successfully. Nature, we know, manages pretty well to keep up stock in her own domain of these and other miscellanies in the plant way, with none of the fuss that distinguishes our efforts. She, however, has a perfect aptitude for the work, and is sure of the attainment of her object sooner or later, for she never fails in filling up blanks with the right thing in the right place, and at the right time. We, on the contrary, must confess that we work often very much by rule of thumb in this matter, forgetting or ignoring what we do know of her ways and means, and often even setting them at defiance. Yet our success is not despicable, and it is attained usually with less waste of time and material, all things considered. The question whether the seeds of these hardy plants are to be sown in the open air or under glass will depend for its answer on whether there is a choice; and if there is a choice, the final decision will be determined by other considerations. For the mere purpose of keeping up stock of the easy-managed vigorous kinds in private gardens, it is in no way necessary to incur the additional labour caused by rearing

them under glass: generally speaking, they require as much labour and attention, when so treated, as more valuable things; and there being little risk in treating them with less consideration, we need not hamper ourselves unduly with them. With a numerous group, such as *Delphinium* and the herbaceous *Pæonies*, which will not bloom the first year from seed, and some such as the latter, that are slow to germinate, even when raised under glass, there is obviously nothing to gain in raising in the more troublesome way in point of time; and unless we have reason to suspect that, on account of long keeping or other circumstances, the vitality of the seed is low, and would therefore have a better chance under glass, all such may very well be sown in their own element out of doors. But new and rare subjects, whether the seeds are saved from our own collection or obtained from other sources, and all the more choice species and varieties that it is desirable to make the most of, it is better if possible to sow under glass. And there are many perennials—such as most *Pentstemons* of the garden varieties, varieties of late-blooming *Phloxes*, some *Salvias*, and a host of others—which, if sown early under glass, may be bloomed the first season,—a consummation desirable enough, even in the case of things that we know well, but greatly more so when our expectations are whetted by novelty, rarity, and surpassing excellence. All these, and any that are above average in intrinsic worth, it is desirable to sow under glass; and generally, when only limited quantities are required, it may be looked upon as the best way, because by it the object is soonest attained, and with the least risk of failure. Assuming, then, that it is desirable and convenient to sow

a miscellaneous lot of seeds of perennials under glass, I would here describe what I have found in my own experience successful practice.

It is necessary at the outset to state that, be the structure what it may, it is requisite that it should be in two compartments. If only a two-light frame, it should be divided under the rafter with boarding; and if hand-lights only can be conveniently set apart for the work, there should be a set of them in addition to those occupied by the seed-pots immediately on their being sown. The reason why this is urged is, that as all seeds do not germinate alike quickly, and it is desirable to keep up conditions in the seed-frame that are inimical to the wellbeing of the plantlets, a fit place should be in readiness to receive those that start early as soon as it is necessary to remove them, and in which they may receive that treatment essential to their healthy and vigorous development. The frame or hand-light should be prepared for the work by being thoroughly cleaned and repaired if necessary. The site for the frame should, if possible, be sheltered; but it is indispensable that it should be in a light position—one in which it may enjoy the fullest influence of the sun. The frame will require further preparation when placed in its site, by having plunging materials of some sort put in the bottom. This may be soil, leaf-mould, sand, or coal-ashes; but for the seed-frame the latter is perhaps best, and it is generally convenient to obtain. The next requisite is soil to sow in: any good light loam will do, and it should be passed through a coarse sieve in order to remove all the larger stones and other gross matter, as well as to equalise the mechanical condition of the mass. Of course the better

the quality of the soil—that is, the fresher it is—the more desirable ; but it is not necessary, but rather objectionable, that it should be very rich. A little leaf-mould, if procurable, may be added ; or, if there is reason to suppose it is poor, a moderate allowance of old manure, previously dried and rubbed through a quarter-inch sieve, may be used, either as a substitute for, or along with, the leaf-mould, according to convenience, and as the condition of the soil may suggest. As much sharp sand may be added to the mass as will render it light and porous ; and the whole should be turned about and rubbed well with the hands, so as to insure a thorough and equal incorporation of the materials throughout. During this process it will prevent much after-annoyance and trouble if a sharp look-out is kept upon worms, whether earth-worm, wire-worm, or the larvæ of insects, with a view to their destruction as far as possible. A small portion of the soil may be sifted through a quarter-inch sieve, and have a little more sand added to it, and be set aside conveniently for use in covering the seeds and in making a suitable bed for those that are minute. The pots are the next consideration, and they should be clean and dry ; if not new, they must be washed and thoroughly dry before being used. The best sizes for this purpose are those of four or five inches diameter at the top : the small mass of soil that these contain is less liable to become sour, should the seed sown in it be slow to germinate—and in such cases it is of the first importance to anticipate and provide against evils ; while in all cases those sizes will be found generally convenient. They may not be equal to the reception of the stock in hand of all kinds of seed, but better duplicate pots than lum-

bering large ones, which have nothing to recommend their use but the circumstance that they are big enough to receive the contents of a packet, and that they may save a little room. Pots, as many as required, should be drained by placing a few crocks or fragments of broken pots, not too small, in the bottom, over which a film of clean moss or the rough material rejected in sifting the soil, if it is fibrous, or anything else handy that will act as a filter in preventing the finer particles of soil from working in amongst and destroying the efficiency of the drainage, should be laid. The soil may then be filled in to within three-quarters or half an inch of the top or rim of the pots, making it moderately and equally firm in the process, and the surface should be nicely smoothed by means of a disc or circle of wood, of such diameter as will work easily inside the pot. As many labels as will be required should be made ready: they are generally slips of wood five or six inches long, and three-quarters of an inch wide, smoothed and painted on one side, on which the name of the subject is written; but they may be had in zinc, which is less destructible, at a cheap rate. At any rate, the practice adopted by many amateurs of using a slip of paper, or the packet itself, stuck in a cleft stick, is not advisable, inasmuch as it leads too often to loss of names and consequent confusion, owing to the perishable nature of the material. Before proceeding to the actual work of sowing, it will further conduce to orderliness and despatch if the labels are written, and arranged, along with the packets to which they respectively belong, within convenient reach of the operator. These preliminary details will appear tedious on paper, and they are tedious to write, but not so to accomplish—and when done, the

work is about finished ; and it must be remembered that a good foundation, to which the right performance of these details tend, is the first and most important step towards success. But all is now in readiness for sowing. In sowing large seeds there is practically no difficulty. The errors of sowing and covering too thickly are rarely committed in their case, because their bulk suggests, even to the inexperienced operator, a tolerable idea of their requirements in both respects. Small seeds, however, such as those of most *Campanulaceæ* and *Lobeliaceæ*, are often destroyed by reason of too deep covering, and the seedlings by too thick sowing. It is impossible to lay down a rule that would be applicable to all cases and circumstances for practice in either operation, but it is more safe to aim at thin sowing than thick ; and as regards covering small seeds, it will be found generally a safe practice not to exceed much their own individual bulk—that is, when they are to be treated in the way to be immediately described. When all are sown and duly labelled, the pots may then be put in the frame, and plunged to the rims in rows neatly and level. Special care should be taken to secure a level bed to the pot ; for if it should lean to either side, the soil will be carried from the higher to the lower when water is applied to the surface, and the seeds consequently be laid bare. When all are set in the frame, a gentle sprinkling of tepid water may be given to the whole through a fine-rosed watering-pot. The frame should then be shut up and kept close ; for, assuming that all above described has been accomplished about the first week in March, there will be no fear of suffering from a too high temperature for a week or two at least, and any bright sunshine that

may occur will be better to be moderated by the use of a light shading of tiffany or other floral shading. It will be necessary to use some kind of covering material for the glass at night, till the nights become so warm as that it may be dispensed with. Straw or mats will serve this purpose well ; but they must be kept in a thoroughly dry condition, otherwise they are useless. In very cold weather, such as often occurs in March, it will be well to put the covering on early in the afternoon, while the sun is yet on the frame, with a view to retaining the heat that has been absorbed during the day. When watering becomes necessary, it is requisite to do it with discrimination, applying the water only to such pots as appear to want it, and always with a finely-perforated rose—and from first to last the water should be tepid. As the day lengthens and the sun gains power, it may become necessary to admit a little air at the top of the frame. The temperature must not be allowed to ascend at any time above 80° without a little air being admitted ; and it should be done by tilting at the back in preference to pushing the light up or down. So long, however, as there are no plants appearing in any of the pots, the temperature of the frame may be regulated quite well by the use of the shading ; but when they begin generally to rise above the soil, a little more discriminate use of the shade and a bolder admission of air will have to be adopted. When any considerable number of the pots show a reasonable crop of plantlets, they should be moved from the seed-frame to that which it was remarked at the beginning of these suggestions should be in readiness to receive the kinds that would germinate and come away earliest. In their new quarters

it is requisite to keep them close to the glass—a foot will be near enough, but better nearer than more distant; and the pots should be plunged as before. Gradually inure them, after they have been a few days in their new position, to more light and a freer circulation of air, being guided by caution; and in the latter respect the character of the weather must determine whether the air should be admitted by stint or freely. Cold frosty winds must be excluded, while on soft balmy days a good circulation may be kept up. Air should be admitted as early in the day as possible, and the frame be closed early in the afternoon. Watering is best done in the morning also, and carefulness to avoid dashing small weakly plants must be exercised, else many deaths will occur; and as a further measure of safety, only tepid water should be used up till the end of April. After that time any soft water that has been well aerated by having been exposed for some days to the influence of the air will answer the requirements well, but cold spring water immediately drawn from wells or pipes is injurious when applied to well-developed plants even, and is especially destructive to seedlings. When the seedlings of any sort are sufficiently large to be handled conveniently, it is time to set about pricking them off or transplanting them. This is a most important point, and attention to it will not admit of delay without loss of time in the object aimed at—*e.g.*, an early establishment of the plants in their permanent quarters; and entails increased difficulty in the operation itself, and often risk also of utter failure. This work must be anticipated, and preparations made for it. Those possessed of plenty of frames, and who desire to get up

a large stock of duplicates, should have a frame in readiness to receive the newly-transplanted stock, assuming that the pricking off is to be done into pots—and I would recommend that plan to all who wish to realise early results for their labour. But it will save some labour and trouble if the seedlings are pricked out in the frame in good sandy soil that has been passed through a rough sieve: in fact, such soil as has been already described as fit for the seed-pots will do equally well for transplanting into, but the mass need not be quite so sandy—only a thin stratum of the surface need be so, in order to facilitate rooting. If pots are adopted, they are better small than large, for the reasons urged regarding the seed-pots; much, however, will depend on whether large stock or small is wanted, and the available space under glass for their accommodation. But assuming there is plenty of convenience for raising a moderate stock of duplicates, 3-inch or 4-inch pots may be regarded as the most convenient. It is necessary to go through the same preliminaries as to draining and filling the pots with soil as has been already detailed for the seed-pots, but the soil may be filled up to the rims. When all is in readiness, the operator will carefully raise the seedlings in the seed-pot in a general way first, by means of a flat sharp-pointed slip of wood, till they are all quite disturbed in the soil; then selecting the strongest for pricking out, if all are not required, he should dibble them into the prepared pots at distances of two inches apart round the circumference, and one in the centre, each pot being labelled as finished with labels already prepared for the purpose. When all are pricked off, and

have received a gentle watering to settle the surface soil, but not sufficient to saturate the mass of earth in the pot, they may be transferred to the frame, plunging the pots as before recommended. The frame will require to be kept close for a few days, and shaded from bright sunshine till the plants have somewhat recovered from the effects of transplanting, and be afterwards treated, as regards shading and the admission of air, in the way directed above for the frame they occupied previously. If the pricking off is to be made directly into soil in the frame—and it has much to recommend it to those who have only scanty time to devote to watering, and only very limited space—the mode to be adopted is the same as in transferring to pots, only that straight lines and tolerably exact measurement must be attended to. A piece of string long enough to pass from side to side of the frame, or a straight-edge in wood and two measuring-sticks two inches long, with a board or couple of boards to prevent treading and disturbing the surface, are aids that are requisite on this plan. If the work is not done regularly and correctly, it is doubtful whether economy of space will ultimately be effected. The measuring-sticks must be used to tell off the first line from the side of the frame, and a string be stretched, or a line formed by the straight-edge being pressed equally into the soil from end to end, just sufficiently to guide the operator in planting. The plantlets are then to be dibbled on the line two inches apart, and the succeeding line be placed the same distance from the first—and so on to the end. The labels are best placed so as to read from the front of the frame, with their backs to the subject they indicate. By the first or second week in May many will

have made considerable progress, and may then be subjected to a process of hardening off, or gradual inuring to the conditions of the outer air, preparatory to being finally transferred to their permanent positions in the borders. Shading should have been discontinued some time before this, and a little air have been left on by tilting at the back at night. And now the air may be freely increased at night, and the lights be taken off in the daytime, using them only for the purpose of protecting the plants from heavy thunder-showers and chilly nights, till near the end of the month, when they may be laid aside altogether, as by that time the plants may be turned out without any risk, notwithstanding their tender nursing.

We must return to the seed-frame briefly. Many kinds of seeds, as before stated, are slow to come away, and must not be hastened, as nothing is to be gained thereby in their case. But impatience and hasty decisions as to the probability of their ever making a start should not be allowed to affect the chance of their germinating, by inducing careless treatment. A uniform equable temperature should be kept up as long as there is any hope, and that should extend in the case of some subjects at least till the following season. Some *Ranunculaceæ*, as Anemone and Trollius, Lilies and other *Liliaceæ*, the perennial Gentians, Primula, and others of the same natural order—some *Umbelliferæ*, as Eryngium and its allies, and Iris and other hardy genera of that natural order—are often slow to germinate (not, however, invariably so), to the extent of lying dormant after sowing for twelve months ; but if they do not start the first season they may do so the second, and therefore they should

not hastily be disposed of. The majority of the kinds will, however, have germinated if they are to do so the first season by the middle or end of July, and up to that time the treatment indicated should be kept up. By the middle of August, at latest, all efforts at inducing those which have not germinated to do so that season should cease, and more air be admitted, even to the removal of the lights wholly during the day, heavy battering showers only being objectionable, and they must be excluded by all means. Cleanliness and complete freedom from weeds require to be attended to throughout the autumn and winter, and the following March should be begun by the same treatment as has already been detailed. Those seedlings which have started late, and weakly subjects generally, should not be hazarded out in the open borders the first winter. In soils that are liable to much disturbance by frost, and wet soils in particular, they would have but little chance of surviving the ordeal; and even if they cannot be afforded frame accommodation, it would be better, nevertheless, to keep them in their pots, plunging them compactly together in some sheltered handy corner, where their condition and requirements may be taken in at a glance.

In the foregoing details the circumstances of the better-appointed classes of amateur and other small gardens only have been taken into consideration. With humbler appliances, such as hand-glasses, however, the treatment required is the same, the difference being only in the structure. More economy of space and labour will attend the practice of sowing simply in the soil without pots, each sort in a line, or part of a line, by itself; but unless the cultivator, from long experience,

is enabled pretty accurately to sort and sow those kinds together which are likely to germinate within a short time of each other, he will find himself in great embarrassment by-and-by as to how seedlings are to be managed under the close enervating conditions that are most conducive to successful germination. And this process of selection is, moreover, rather too nice a one for even the most experienced to venture on with absolute confidence in all cases. Were we always cognisant of the conditions under which the seeds were harvested and kept since then, and of their age, there would be little difficulty; but this is not always possible. The difference of time between the germination of old and new seeds of the same species in ordinary circumstances amounts to weeks in many cases, so that any sorting or selection that may be attempted is not to be relied upon; and all these contingencies have to be weighed before the less troublesome method of sowing a miscellaneous lot of hardy perennial seeds in a hand-glass, frame, or compartment of a frame, without pots is decided on.

If a mild hotbed can be devoted to the raising of the seeds under glass, it will greatly facilitate progress and the realisation of results. The bottom-heat requisite is about 65° or 70° , and it should be maintained pretty evenly to something between those figures. The management of the heated frame is precisely the same as that of the close cold frame, but there will be greater watchfulness required on the part of the attendant against sudden risings of temperature from temporary glances of the sun, and more careful airing and shading will be necessary at all times. The seedlings, also, when removed from a heated frame, will require more care in their after-management, if they are to be immediately

put in a cold frame. They will be longer before they can bear the influence of the outer air, and the process of inuring them to it must be more cautiously gone about. If, however, a compartment of the warm frame, or a supplementary heated frame or hand-light, can be devoted to them, there will be less trouble and more advantage every way, for it is doubtful whether the greater risk that is incurred is compensated for by any considerable quickening of the germination, unless it can be followed up by the same stirring treatment throughout the earlier stages of the growth of the seedlings.

There are many gardens that are not provided with glass of any kind to devote to the rearing of hardy perennials, and there are many cottagers and amateurs whose means may not admit of the appliances necessary to carrying out the foregoing details, and in these cases there is no choice but to do the best they can in the open air. It has been already remarked that there is little occasion for hampering ourselves or our means with the more common or less intrinsically valuable of hardy perennials. But with all kinds to which any special value attaches it is necessary to take measures that will insure the greatest amount of success, and for this reason I would advise sowing such in pots, even when they are to be raised in the open air. A well-sheltered spot should be chosen which will enjoy a large amount of sunshine, and a good bed of ashes be made up, somewhat deeper than will be required, for the pots to be plunged in, in order to provide against worms finding an easy entrance into them; and the sides may be kept up by rough boarding, bricks, or anything else more handy that will serve the purpose. The pots may be plunged in this when sown, and some means adopted to provide shading and immu-

nity from heavy rains. A few hoops arched over the beds, on which to stretch any handy light shading material when required, will secure this sufficiently well. The screen should only be used when necessary. Watering should be done in the morning, and the water will be better if the chill is taken off it before being used. When the seedlings are large enough to handle, a bed, big or little, according to requirements, should be in readiness for them against the occurrence of a showery day or two, into which they should be pricked, on the plan already suggested for pricking out in frames, be sprinkled with water to settle the soil about them immediately after being pricked out, and attended to with respect to watering and shading till they are fairly established. Those seedlings which come away late will not be sufficiently advanced to be safely trusted out in the open borders by the time winter comes on ; and as a measure of safety it is advisable to prick them into pots, so that they may be stored away during winter handily and compactly, in such a way as that they may get a little protection if necessary in the shape of a few branches, straw, or mats.

Perennial seeds may be sown at any time from March or April to August. It is not advisable, however, to sow weakly or diminutive kinds so late as August, except they can be provided with frame accommodation in winter. Those sorts, however, which we are aware will not germinate the season they are sown, may be sown at any time if under cover, or as long as the state of the soil will admit of sowing in good condition out of doors ; and some saving of time will thereby be made, as they will most likely start away pretty early the following summer.

A HANDY BOOK
OF
HARDY HERBACEOUS
PERENNIALS.

ORD. RANUNCULACEÆ.

IN this natural order there are many plants of the most showy and elegant description. It is essentially an order of herbaceous plants, for if *Clematis* with climbing shrubby stems, and *Xanthoriza*, a low-growing uninteresting shrub, be excepted, the remaining mass are either perennial, herbaceous, biennial, or annual plants. The largest number also are hardy, being natives of the temperate and colder parts of the earth; or if found in the tropical regions, it is generally at such high elevations as to surround them with climatal conditions similar to those of more northern latitudes. One of the shrubby genera, and most of the herbaceous, are plentifully represented in the flora of our own country; and in bygone days, before the modern fashion of bedding-out was thought of, the style and beauty of the flower-gardens of this country greatly depended on the merits of various members of this large family.

Adonis is a small genus, comprising a few hardy perennials, with some annual and biennial plants. Its general character is well illustrated in the well-known hardy annual *Flos-Adonis*, an improved variety of *A. autumnalis*; but in some of the perennial species the flowers are larger and more showy than in it. There is scarcely any variety of colour in the perennial section of the genus, all being yellow in one shade or another; nor is

there much diversity of habit or stature; but there is some difference in the time of flowering, which renders them available for different seasons and purposes. The selection need not, however, embrace more than what secures this variety of usefulness along with the best of the species. They delight in rather a moist soil—that is, one tolerably retentive but well drained—and they should not be often removed, and are impatient of the disturbance caused by digging or forking deeply; but annual pricking of the surface of the soil with a fork, and turning in a little peat or well-decomposed leaf mould, or very old manure, is of much benefit to them. They may be increased by seeds sown in March, in small pots or shallow pans, in a compost of sandy loam and leaf-mould, or by division of the roots just as growth commences.

A. apennina (*Apennine A.*) does not appear very distinct from *A. vernalis* in character, but as it begins to flower as that species ceases, it is valuable as a means of continuing a succession of bloom. It grows from 9 inches to 1 foot high, with large bright yellow flowers which appear in April and May, suitable alike for the rockwork or the mixed border, and very beautiful in its season. Native of the Alps of Europe.

A. pyrenaica (*Pyrenean A.*) is rather taller than the last, growing 1 foot or 15 inches high. The root-leaves are on long stalks, and rather finely divided. The flowers are large, but contain fewer petals than the last, and appear in the end of June and throughout July. A very good plant for the mixed border, and may also be used on the rockwork with good effect. Native of the Pyrenees.

A. vernalis (*Spring A.*)—This is the best of the group, and is a very old inhabitant of our gardens, though now rarely seen. It grows about 9 inches or 1 foot high, is destitute of root-leaves, but the stems and branches are clothed at the joints with finely-cut stalkless foliage, and terminate in very large bright yellow flowers in March and April. Native of the Alps of Europe. Where spring flower-gardening is done on the plan of filling the summer flower-garden with bulbs and other early-blooming plants for spring display, this, along with *A. apennina*, will be found invaluable, on account of the bright contrasts they will afford grouped along with Hepaticas, Primroses, &c. For such a purpose as this, their constitutional antipathy to frequent removals makes it necessary to cultivate them in pots plunged to the rims in the reserve ground. They will require frequent refreshings on the surface with compost of a rich but well-decomposed quality, occasional repotting when the mass of the soil becomes bad through age or defective drainage, and for the

purpose of increase of bulk or quantity of plants. They will require, also, careful attention to the state of the drainage, and a plentiful supply of water in the growing season. These plants are all easily propagated by division in spring when growth commences, or by seeds sown in small pots or pans in a cold frame in March.

Anemone comprises rather an extensive group of highly-ornamental plants. In the various species there is much variety of colour and some diversity of habit, and the uses in ornamental gardening to which they may be applied are almost as various as their natural characteristics. All the species are hardy; but some are natives of regions so lofty that in our comparatively favoured climate they seem to live too fast, and consequently never appear in good condition, and soon lose constitution and die. *A. vernalis* may be taken as an example of this class, and it is rarely seen in good dress in cultivation, yet is unquestionably one of the finest of the group; but such peculiar species have been omitted in making the following selection. Any peculiarity of soil or treatment required by any species will be duly noted in its proper place, but here it may be remarked generally, that Anemones prefer a rich and rather heavy loam. They succeed well, however, in many light soils; but in the more tenacious clays many of the smaller species refuse to grow, and a very liberal incorporation of gritty matter and leaf-mould is the only sure means of reconciling them to such. They may be propagated by seeds or by division of the roots. The seeds should be sown in February or March in a cold frame, or, if convenient, in a mild hotbed, using small pots or pans, and loam and well-decomposed leaf-mould, with a liberal allowance of sand. Division of the roots may be done either in early autumn or early spring. All the very early-flowering species are better divided about the end of September or throughout October, or indeed any time soon after growth is matured and the leaves decayed, but the later bloomers may be left over till March.

A. alpina (*Alpine A.*)—This is a tall-growing species of very distinct appearance. It grows about 18 inches high. The leaves are large, much and deeply cut, and of a fresh green colour. The flowers are large, cup-shaped, creamy-white inside and pale livid purple outside. A beautiful plant either in bed, border, or rockwork, and should be in every collection of hardy garden plants, being free in growth in any soil of fair quality. Flowers in April and May. Native of most of the great mountain-ranges of Europe. *A. sulphurea* of some catalogues is but a well-marked variety of this species with lemon-coloured flowers.

A. apennina (*Apennine A.*) is rather a diminutive plant, but one of the loveliest of spring flowers. It grows about 6 inches high, with small, dark-green, much-divided leaves, and large bright blue flowers on slender erect stalks an inch or two above the foliage. It has become naturalised in a few localities in England and in one place in Scotland, and in some of our floras is accounted indigenous; but it is no true native, though by naturalising itself in these few cases it has shown that our climate is not unsuited to it. I remember some years ago seeing a spot of some square yards in extent, in an open wood in one of the midland counties of Ireland, entirely carpeted with this lovely plant and *A. nemorosa* in pretty equal mixture, and in flower. It was no design; they had probably been exiled years before to this spot from the kitchen-garden only a little way off; but it was a happy accident, and the effect was very beautiful. The natural soil was a very heavy clay on a damp cold bottom, and it was consequently very moist; but on the surface of the clay was a thin stratum of vegetable mould, the accumulations of many years from the trees overhead, and in this the *Anemones* luxuriated vigorously. How desirable it is that our shrubberies, woods, pleasure-grounds, and semi-wild places should be embellished with such loveliness as this plant and hundreds of others yield at so little cost and trouble! It is one of the earliest-flowering species, flowering in March and April along with *Hepaticas*, *Primroses*, and many other spring flowers, and is therefore available for spring bedding, and for this purpose should be kept in pots in the reserve ground. It is charming on rockwork, or in bed or border, should be planted everywhere, and is one of those bright things that should have a place in every amateur's garden. Divide in autumn. Native of the mountains of Italy.

A. coronaria.—This is the parent of the showy-coloured *Poppy Anemones*, once so engrossingly popular, and which still worthily hold a distinguished place among gay border-plants. The fine double varieties are cultivated at great cost and trouble, requiring very special and expensive preparation of soil, and much care and attention throughout the whole period from planting to lifting time, to insure success. The single varieties require less of this inconvenient expense and labour, and are as useful for all purposes, except for exhibition; and they may be kept in supply by annual or biennial sowing as easily as any hardy annual or biennial plant. Sow in April or May in a well-dug, lightly-manured piece of ground, in a warm situation out of doors, and transplant in autumn to the blooming quarters, planting the roots 2 or 3 inches apart, and they will

flower strongly the following season. In order to sow the seeds regularly, it is necessary to rub them well with the hands in a little sand, otherwise they will adhere to each other in lumps, on account of the fleecy covering in which each seed is enveloped. Flowers in April and May, or very much owing to the time of planting the roots, as a succession of flowers may be kept up of two or three months' duration by planting in September, October, and again in February. Native of the Levant.

A. hortensis (*Garden A.*)—This and the *Poppy A.* are very near relatives, and there is little doubt but that the blood of the two has become considerably mixed in the long period of their dwelling together in gardens; but the flowers of this species, and of all the varieties that can be directly traced back to it, are more starry in form than those of the other, and the foliage more hard and leathery, and with rather broader lobes. The rather rare variety named *A. h. fulgens*, which in some catalogues takes the position of a species, is a most brilliant sort, quite unapproachable in its dazzling shining crimson scarlet, and, like all the varieties of this species, is remarkably easily grown. The colour is much wanted in spring flower-gardens, and the compact habit of the plant renders it available for grouping with many other spring-flowering subjects with striking effect. The varieties of this and the preceding species should be naturalised in our parks and pleasure-grounds: they are so hardy and so easily increased in any quantity by means of seed. Flowers the same time as *A. coronaria*. Native of Italy.

A. japonica (*Japan A.*)—This is a fine stately species. It grows to the height of 2 or 3 feet, with dark-green, rather ample foliage, broadly and bluntly lobed. The flowers are large, cup-shaped in opening, rose-coloured. The variety named *Honorine Jobart*, with pure white flowers, is a beautiful and effective plant. Both should be cultivated in quantity where large supplies of cut flowers are required in late autumn and early winter. I have had them in flower in the northern counties of Scotland at Christmas in mild winters. They should be planted in all situations and aspects for this purpose. Begins to flower about August or September. Divide in spring. Native of Japan.

A. nemorosa.—This is the *Wood Anemone* which adorns our woods so abundantly with its pearly-white flowers in March and April. It is about the same in height and habit as the *Apennine A.* already described, and forms a beautiful companion to it. It may be used in spring bedding-out, and should be planted everywhere that these simple spring gems of Flora

may appropriately be put. There are several beautiful varieties of the *Wood Anemone*. The double white is the most common, and a very useful plant for many purposes, and invaluable for cut flowers, yielding a great profusion of them at a time when masses of flowers are scarce, and they keep fresh in the cut state for long. The double rose or pink variety is pretty, but rather rare; and there has long been in the country a beautiful blue variety very rare and little known. Divide in autumn.

A. palmata (*Palmate-leaved A.*)—This is a very distinct and beautiful species. It grows about 8 inches high, with leathery, kidney-shaped, bluntly-lobed leaves, and large shining golden flowers. It is more difficult to grow than either of the foregoing: being strictly alpine, it refuses to grow in the open border, but succeeds admirably on rockwork when ample depth of soil is provided, and all the more rampant and encroaching subjects are kept at a proper distance from it. There are two varieties in cultivation, but rare; the one with dirty white single, the other with double yellow flowers. Divide in autumn or very early spring. Native of the regions of the Mediterranean generally.

A. pavonina (*Peacock A.*)—This is near akin to the *Poppy Anemone*, and grows about 9 inches high, but the gaily-coloured floral leaves are shorter, narrower, and more sharply pointed. The colour of the flowers is bright rich red. It is an excellent border or rockwork ornament, and succeeds best in light rich soil well drained, in a warm situation. Flowers in April and May. The double variety is the best, being more lasting than the single. Divide in autumn. Native of the south of France.

A. Pulsatilla (*Pasque flower*).—This species is very distinct from any of the foregoing. It is a true native of Britain, but very local in its distribution; and though small in its wild state, it becomes a free-growing beautiful plant under good cultivation. It grows about 1 foot high, with large purple flowers. Succeeds best in deep, rich, well-drained loam. Flowers in April and May. Divide in early spring.

A. ranunculoides (*Ranunculus-like A.*)—This beautiful golden-yellow species is near to the *Wood Anemone* in character, and, like the *Apennine A.*, has become naturalised in some parts of England. It is a beautiful companion to both its congeners, being about the same in height and habit, and flowers about the same time, and should be planted freely along with them in like places. It may not be found to succeed so well in all cases as the other two; but this should discourage no one from trying it who has the opportunity of doing so. In the

spring flower-garden it will be found a valuable and attractive subject, and every amateur should have a tuft of it in his garden. It does not thrive so well in heavy as in light soils, dwindles and dies in stiff clays, but luxuriates most in light loams with much decomposed vegetable matter in them; and peat is also very congenial to it. Native of the south of Europe. Divide in autumn.

A. rivularis (*Rivulet A.*)—This is a fine species from northern India. It is showy, free-growing, and free-flowering. Grows to the height of 18 inches or 2 feet, with numerous showy white flowers filled with rather conspicuous purple stamens and pistils. Delights most in rather moist soil, and is a very useful border-plant. Divide in early spring.

A. sylvestris (*Snowdrop A.*)—This is one of the handsomest of the group, though not the most showy. It is a free-growing species with pure white flowers, resembling somewhat in the bud the flowers of the *Snowdrop*. It is hardy and unfastidious as to soil, but prefers rather a shady situation, and would doubtless adapt itself easily to woods and semi-wild places in moderate shade. It should be in every collection of choice hardy herbaceous plants, being a beautiful bed or border ornament, and fit also for rockwork decoration. Height about 12 or 15 inches. Native of Italy, France, Germany, and Siberia. Flowers in April and May. Divide in spring.

Aconitum (*Monkshood*).—There is much diversity of opinion amongst authorities as to the precise limits of species in this genus. Some maintain that a hundred or more distinct forms are comprised in it, and others contend for only a very limited number; but between the two, the nomenclature of the family is in a most perplexing tangle. My own experience of some twenty or thirty so-called species under cultivation has led me to the opinion that many mere varieties have been described as species, and that a very short list may be made to include all that is best and most distinct in the forms at present in cultivation. The gay, bold, and striking character of some of the Monkshoods is very well known. They form splendid backgrounds for wide mixed borders of perennial plants; they are useful also for producing distant effects in pleasure-grounds in association with shrubs; and their hardy nature and robust mode of growth fit them well for introducing into open woods and semi-wild places. They do not dislike a little shade, which is favourable to their being naturalised in moderately-shady places, and they thrive in any common soil of ordinary quality. Propagate by seeds in the open air in the end of March or in April, and by division in winter in open weather

and in spring. Some notice should be taken of their dangerous poisonous properties. There are many cases on record of the melancholy and fatal results of eating them through ignorance or inadvertently. This fatal quality abounds in every part of the plant, but is most concentrated in the roots, and every one should be informed of the danger of tampering with them.

A. chinense (*China A.*)—This species grows about 4 feet high, with bold racemes of dark-blue flowers. The stems are very robust, the leaves large and deeply cut, stalked below, and stalkless on the upper part of the stems. Flowers in the autumn months. Native of China and Japan. It is the *A. autumnale* of some, and by others is accounted only a variety of *A. Napellus*.

A. japonicum (*Japan A.*)—This, like the last, is by some authors accounted only a variety of *A. Napellus*, but it is a very distinct one indeed, and in the present state of disorder in the family may fairly enough be allowed to hold its specific distinction unquestioned, in gardens at least. It grows 3 or 4 feet high, with stout erect stems, and large intense dark-green shining leaves. The spikes are bold and usually simple and embranched, the flowers large deep blue or violet, and appear from June to September. One of the best of the dark-blues.

A. lycoctonum (*Wolf's-Bane*).—This is a distinct and gigantic species. In rich soils it grows to the height of 6 or 7 feet, with strong, almost woody stems, and enormous leaves, boldly cut and jagged. The panicles of flower are also very large, much branched and spreading, but the individual flowers are smaller than those of most of the *Napellus* type. They are creamy yellow, and appear in July, August, and September. Native of south of Europe.

A. Napellus (*Monkshood*).—Under this name I would speak of varieties of the species that have been circulated as distinct species. They are bicolor, variegatum, and versicolor. They differ from the ordinary condition of the species in having the flowers variegated instead of simple blue. Under the same cultural conditions they appear to be very much alike; but in catalogues slight distinctions of colour and height are ascribed, which may be the effect of differences of soil, aspect, or other conditions. But in any case the plant known under either of these three names is the most beautiful of all *Monkshoods* at present in cultivation. It is a bold-growing erect plant, about 4 feet high, with finely-cut leaves, the stout stems terminating in fine branching racemes of pretty shaded blue and white flowers. They appear in June, and continue throughout July, August, and part of September.

A. tauricum (*Taurian Monkshood*).—This is a fine distinct form, with dark-blue flowers. It is a robust grower, and rises to the height of about 4 feet, with ample but not very much divided leaves. The racemes or spikes of flowers are very long, compact, and cylindrical. Flowers in June, July, and into August. Native of Tauria.

Actæa (*Baneberry*).—This is a small genus of rather distinct aspect, but not of first-rate importance in the embellishment of select positions. The proper home of *Actæa* is in the woods and half-kept places among shrubs, where their features will be in harmony with surrounding objects. They are peculiarly adapted for naturalisation; as they grow well in any common soil, and naturally affect somewhat shady positions. Propagate by division in autumn, winter, or spring. There are four or five species known; but it is only needful to describe one, as they are rather similar in their general appearance.

A. spicata (*Spiked Baneberry*).—This plant is a native of Britain, but is distributed rather locally. It has, however, a very wide geographical range in other countries, being found in eastern Europe, Russian Asia, and in North America, extending in the latter into the arctic regions. In nature it is often a small plant; but in rich soil and under cultivation it grows about 3 feet high, sometimes higher. The leaves are mostly confined to the roots or base of the flower-stems, are large and pinnately divided in a compound manner. The flowers are borne in terminal racemes, sometimes branched, but in weak plants often simple; they are creamy white, and appear in May, June, and July.

Aquilegia (*Columbine*).—This is a showy and interesting group of plants. They are all of moderate height, are neat in habit, and possess beautiful foliage, and in most cases the colours of the flowers are bright and striking, and the structure most interesting. There is a very considerable list of reputed species, but many are not distinct, and a small number concentrate the best qualities of the family in themselves. They are plants of very easy culture, preferring a loamy rich soil, rather moist than dry, but well drained. They are propagated by division in autumn, winter, or spring, and by seeds in March—the choicer sorts in pots, in frames, or hand-glasses, and pricked off before finally planting in the borders in the end of May or beginning of June; but the varieties of *A. vulgaris* and others may be sown in the open border in a warm spot, and transplanted to their permanent position when sufficiently strong. They bloom the first year when sown

early; but in order to secure this, they should be encouraged as much as possible under frames or hand-glasses while in the seedling state. The following selection includes the best and most distinct of the species at present known, and they are fine, in some cases splendid, ornaments for the mixed border, and for rockwork.

A. alpina (*Alpine C.*)—This is one of the best. It grows about 1 foot high, with a considerable tuft of finely-cut leaves at the roots, and rather erect leafy stems, producing numerous large purplish-blue white-centred flowers. Prefers a rather moist shady position on rockwork, with considerable depth of soil. Flowers in May and June. Native of the Swiss Alps.

A. canadensis (*Canadian C.*)—This is a tall and rather graceful species, growing about 2 feet high, with loose panicles of flowers. The flowers are large, but not so spreading as in some, with straight spurs of moderate length, beautiful bright red, shaded with orange in the centres. Flowers in April, May, and June. Native of North America.

A. cœrulea (*Sky-blue C.*)—This is a remarkable and splendid species of recent introduction. It grows about 1 foot high, and produces numerous very large flowers with long slender spurs, light violet-blue, shaded with pure white. Flowers in May and June. Native of the Rocky Mountains. Succeeds best treated in the way recommended for *A. alpina*.

A. fragrans (*Fragrant C.*)—This is not one of the most showy, but is very distinct. It grows about 1 foot high, with downy, somewhat clammy leaves, is very profuse-flowering. The flowers are pale yellow or straw, furnished with short hooked spurs, and appear in May and June. Native of the Himalaya.

A. glandulosa (*Clammy C.*)—This is a very showy and free-flowering species, growing about 18 inches or 2 feet high, with abundant foliage. The flowers are very large, blue and white, and have short spurs. Flowers in May, June, and July. Native of Siberia. There are two or three excellent varieties of this species in cultivation.

A. glauca (*Grey-leaved C.*)—This is a distinct and interesting plant, though not so strikingly showy as some of the preceding. It grows about 18 inches or 2 feet high, with ample glaucous foliage and large numerous flowers, the spurs of which are shortish and red, and shading into the pale yellow of the other parts of the flowers. Flowers in May and June. Native of the Himalaya.

A. Skinneri (*Skinner's C.*)—This is one of the best. It grows 9 inches or 1 foot high, producing numerous scarlet and

orange flowers with long spurs. Flowers in April and May. Native of Guatemala.

A. vulgaris (*Common C.*)—This species is a native of Britain, and is rather a time-honoured plant in gardens. It is variable in its character under cultivation, and many beautiful and some extremely curious varieties have sprung from it. Some of the double varieties are splendid and interesting border-plants, and are very useful for cut-flowers, as they stand long fresh, and may be sent a great distance in the cut state. There are white, pink, lilac, blue, purple, dark-crimson, red, yellow, and variegated colours in double flowers, and they are well worth some space and attention in every garden. There are later and earlier flowering varieties also, and a close succession may be kept up from the end of May till the end of July. There is also a variety with prettily variegated foliage named in catalogues *A. v. Vervæneana*.

Caltha.—This is the common *Marsh-Marigold* so abundant in our marshy places and by brook-sides all over Britain. It is a genus of few species, and were it not for the double-flowered variety of *C. palustris*, our native one, it would be devoid of floricultural interest. This is a good old-fashioned plant not now often seen in gardens, but deserving of a place in any select collection of ornamental hardy herbaceous plants. It is a neat-growing plant about 9 inches in height, with handsome, glossy, dark-green, kidney-shaped leaves, and a profusion of large, double, bright-golden flowers—more golden than the most auriferous *Calceolaria*—and which become brighter and more profuse when showers are plentiful. It is most suitable for the front lines of mixed borders of hardy herbaceous plants, and may be used with good effect on shady damp rockwork, as well as in the way suggested by the natural habits of the single form, and be made to light up otherwise dreary spots in the spring and early summer months. It naturally prefers a very moist soil, and does not object to considerable shade; but it does not refuse to grow in any ordinary garden soil, even if somewhat dry. Flowers from April till well into July. Propagate by division any time from November till March in open weather.

Cimicifuga (*Bugwort*).—This genus resembles and is nearly related to *Actæa*, and, like it, comprises very few species. They are tall strong-growing plants, and may be used for the embellishment of mixed borders and shrubberies, and for naturalisation in woods and partially shady places. They are rarely if at all met with in private gardens, and are little known beyond the precincts of botanical gardens, but are well worth

a place for their distinctive character, if not for actual display. The same soil and treatment as for *Actæa*.

C. cordifolia (*Heart-leaved Bugwort*).—This species grows to the height of about 4 feet, with large ternately-divided leaves, the segments large and heart-shaped, obscurely lobed and sharply toothed; and produces long, rather dense, branched spikes or racemes of white and yellow flowers in June and July. Native of North America.

C. foetida (*Stinking Bugwort*).—This species grows about the same height as the last, if anything taller. The leaves are divided in a similar manner, but the segments are smaller and are not lobed, but acutely toothed and lance-shaped in outline. The racemes of flowers are more numerous and more freely branched. The flowers are small, pale yellow, appearing in June and July, often also continued into August. Native of Siberia.

C. palmata (*Palmate-leaved Bugwort*).—This species is about the same in stature as the preceding, but differs markedly from both in all other features. The leaves are palmate in shape, and acutely but rather roughly toothed. The flowers are produced in panicles, not racemes or spikes, and the forks of the panicles are developed in equal pairs. Flowers yellow and white, appearing in July and August. Native of North America.

Delphinium (*Larkspur*).—This is a numerous group, clearly marked and not easily confounded with either of its nearest relatives the *Columbines* or *Monkshoods*. A very large number of rather variable forms are comprised in it; many species are founded on trivial and inconstant distinctions, and there is altogether much confusion of opinion among botanists as to what should be regarded as the proper limits of species; but there is, no doubt, much difficulty in the way of a harmonious understanding in all cases of this kind where the forms are numerous and run into each other on all sides. The high merits of *Delphiniums* for decoration are well known and universally admitted. Not many groups of plants indeed, of the same extent, contain so few weedy subjects; and yet it does not present the same distinct variety of colour and habit as many genera that comprise not one-tenth the number of its reputed species. But their style of growth is bold and striking; and though only blues, purples, purplish reds and whites, in various shades and combinations, are the sum of the colours at present known in the group, yet these are so bright in most species and varieties, that when considered along with the noble plume-like mode of flowering and imposing habit of

many, some astonishment may fairly be expressed that plants with so many excellent qualities should be so thinly cultivated in gardens generally, and in the gardens of the wealthy particularly. They are splendid objects in every position, and may be used in many ways—in the mixed border, in masses of themselves either in one or several colours, and associated with other flowering plants or with evergreens. I have seen them made to produce a novel and striking effect by pegging them down around the margins of groups of shrubs; and in beds by themselves on grass, pegged in the same manner, but graduating from 1 foot or so high at the edge, to 4 or 5 feet in the centre. They were not models of smoothness, these beds, on near inspection; but at some distance off they were grand—and distant effect was the object aimed at in the case. There is much trouble and labour attending this method, however, as the pegging must be scrupulously attended to during the growing season, and has to be done with much care to prevent breaking and kneeling of the stems; and if it cannot be well done, it had better not be attempted at all. But there is a compensating advantage to be set against the extra trouble and labour—there is a very prolonged succession of flowers consequent on the extra branching that naturally results from the horizontal position of the stems. They luxuriate most in deeply-worked rich loam, rather moist than dry, and make but a poor figure in very dry light soils, unless liberally manured and copiously supplied with water during all stages of growth. To enjoy their beauty as long as possible, it is of much importance to stake and secure their stems at an early stage, to thin out all weak stems so as to admit light and air freely to those that remain, and to remove all seed-pods and decayed flowers as soon as they show themselves. The plants are kept in a vigorous and healthy state for a longer period if attention is paid to lifting and replanting annually, or at most every two years, and giving them some fresh soil or well-decomposed manure to refresh them. Propagate by seed for the production of varieties. Sow in the open air in March or April in a well-dug rich piece of ground in a warm position, and prick the plants out when fit to handle. Choice species and varieties are increased by division in winter in open weather and in spring, and a succession of bloom may be kept up by dividing at successive periods. Cuttings also may be resorted to in the case of rare or scarce sorts, and when large increase is an object. They should be taken when the shoots have grown 5 or 6 inches long, and planted in light rich sandy soil, in pots singly or in masses, according to convenience and the object

in view, and placed in a cold frame, handlight or bell-glass. They may also be propagated in autumn by cuttings when extraordinary increase is necessary. A plant in full growth should be cut down in the middle or latter end of July, and stimulated immediately into growth with liquid manure; and in three weeks or a month the cuttings will be fit to take, and may be treated in the same way under hand-glasses as pipings of Pinks and other hardy herbaceous subjects. In the case of some hybrids of recent production, division or cuttings must be resorted to for increase, as they are sterile and do not produce seeds. The following short selection embraces some of the best and most distinct of the species, hybrids, and varieties of the group:—

D. alopecuroides is a splendid sort, with dense racemes of pale-blue double flowers. It grows from 3 to 4 feet high, and flowers in June, July, August, and September. One of the best.

D. Barlowi (*Barlow's D.*)—This sort grows about 4 feet high, with noble racemes of bright-blue single or double flowers. It is a garden hybrid; and the double is the best, being most lasting in bloom. Flowers in July, August, and September. Of garden origin.

D. bella donna.—This is one of the sterile hybrids alluded to above. It is an erect, very handsome sort, growing 2 or 3 feet high, producing fine racemes of lovely azure-blue flowers. Perhaps in its own peculiar colour this hybrid is unsurpassed for soft lovely effect. Flowers in July, August, and September. The flowers are single.

D. cheilanthum (*Lip-flowered D.*)—This is one of the older species. It is of erect branching habit, about 4 to 5 feet high. The flowers are not of the largest size individually, but are numerous, in long racemes, and intense dark blue. Flowers in July, August, and September. *D. cheilanthum* var. *multi-plex* is a beautiful double-flowered sort, one of the finest of the dark-blues.

D. elatum (*Tall D.*) grows 5 or 6 feet high, with strong erect stems and five-lobed leaves. The racemes are loose, but long; the flowers are blue, and appear in July, August, and September. This is one of the older species, a native of Siberia, and is very striking and handsome, though deficient in floral brilliancy when compared with some of the recently-introduced hybrids and varieties. There is a double-flowered sort which cannot be considered much of an improvement on the normal form.

D. formosum (*Beautiful D.*)—This well-known sort is of hybrid origin. It grows 3 or 4 feet high, with stems of medium strength and somewhat straggling, producing graceful racemes

of bright gentian blue. A very fine sort, flowering with great profusion from June to September. It is one of the best for pegging, its medium, strong, and rather flexible stems being more favourable to the mode than those of more rigid habit.

D. grandiflorum (*Large-flowered D.*)—This is another of the old species. It grows 3 or 4 feet high, with erect branching stems. The racemes are rather open, the flowers large and intense dark blue. Flowers from June throughout the summer and autumn. Native of Siberia.

D. grandiflorum flore-pleno differs from the preceding mainly in the flowers being double; but the growth is scarcely so tall and rather more rigid, and the racemes are more dense and cylindrical.

D. grandiflorum album differs from the species only in the colour of the flowers, which are white instead of blue, but not a good white.

D. Hendersoni (*Henderson's D.*)—This sort is of garden origin. It grows about 2½ or 3 feet high, producing fine racemes of bright-blue flowers. Like *Formosum*, it is one of the most useful for pegging down.

D. Hermann Stenger.—This is a very handsome sort, also of garden origin. It is rather a robust grower, reaching the height of about 4 feet, producing fine racemes of blue and rose double flowers. It is distinct in colour, and flowers in July and August.

D. hybridum (*Hybrid D.*) is a tall hairy species, with erect stems, and much and finely cut leaves. The racemes are long, compact, and cylindrical, and the flowers light blue. Flowers from June to September. Height about 4 feet. Native of Siberia.

D. hybridum flore-pleno differs from the species in no other respect than in having double flowers.

D. magnificum.—In habit, style of inflorescence, and form of flowers, this sort resembles *Bella donna*, but the flowers are deep brilliant gentian or purplish blue. Height about 4 feet. Garden hybrid.

D. pulchrum.—This is a single-flowered pale-blue sort of great beauty. It grows about 2 or 3 feet high, and produces its flowers in June, July, and August. Of hybrid origin.

D. ranunculifolium flore-pleno.—This sort grows about 4 feet high, with long striking racemes of azure-blue flowers, very double. Flowers in June, July, August, and September.

D. sinense.—This species is of very rigid growth. The leaves are deeply and finely cut. The flowers are very dark blue or purple, in rather loose erect racemes. Flowers from July till

September or October. Native of Tartary. Height from 2 to 3 feet.

D. sinense flore-pleno is like the species in all respects save the double flowers.

D. Wheeleri.—This is one of the most striking and effective in the group. It grows about 4 feet high, producing immense racemes of bright-blue flowers. Flowers in June, July, and August.

Eranthis hyemalis, syn. **Helleborus hyemalis**.—This, the well-known and admired *Winter Aconite*, needs no description. It is one of the earliest and hardiest of spring flowers, throwing up its pretty yellow blossoms often under the melting snow, and continuing five or six weeks in flower, appearing first usually in February, but earlier or later accordingly as the weather is mild or rigorous. It is indispensable in the spring flower-garden as an edging, or in masses associated with other colours, and may be introduced anywhere it is thought proper. It flourishes almost as well in dense shade as in open exposure, and in any kind of soil. Few plants may be naturalised with less trouble and expense. It is invaluable for town and suburban gardens, caring less for dust and smoke than most plants. Its tuberous roots multiply rapidly, and furnish ample means for annual increase. It is the only species known in cultivation. Native of Italy.

Helleborus.—The well-known Christmas Rose is a familiar type of this group. It is not numerous in species, and few have any striking pretensions to floral effect; but most of them bloom at a season when flowers are so rare that even commonplace things become valuable. The structure of the flowers, too, is peculiar and interesting; and this, to those who look deeper than the surface characteristics of colour and form, is no slight recommendation. They grow freely in any ordinary soil, provided the situation be moderately moist and shady. Their natural preference for shady places renders them very fit subjects for the purpose of naturalisation in open woods, in glades, and among shrubs. In such positions they usually come earlier into flower than when planted in more exposed places; but by planting in different aspects a more prolonged succession of flower may be kept up. Propagate by division in autumn, or immediately after the flowering season is over. They should not be often disturbed.

H. atrorubens (*Dark-purple Hellebore*).—This species grows from 1 foot to 18 inches high, with strong, somewhat angular stems, clothed with tough, leathery, pale-green, lobed and stalked leaves, the lower ones on long stalks, and much larger

than the upper ones. The flowers are large, dark purple changing to green. Flowers in March, April, and May. Native of Hungary.

H. colchicus (*Eastern H.*)—This fine and distinct species grows about a foot or 15 inches high, producing dense panicles of large red flowers in March and April. A very scarce species, and the best of the red or purplish-red sorts. Native of Asia Minor.

H. cupreus (*Coppery H.*) grows about 9 inches or 1 foot high, producing numerous large coppery-red flowers in January and February; one of the earliest to appear, and very distinct. Native of Hungary.

H. niger (*Christmas Rose*).—This fine old plant is so universally known that any description would be superfluous. Its beautiful white or pinkish-white flowers are ever welcome at the dreary flowerless season in which they appear. There are three distinct and permanent varieties of it in cultivation. The ordinary form, or that most commonly met with, divides and connects the other two. *H. niger*, var. *angustifolia*, is a starveling plant, and not worth growing beside the other two except for curiosity's sake. *H. niger*, var. *major*, named also *atrovirens* and *grandiflorus*, is the reverse of this, and exceeds the typical form in beauty and vigour as much as the other falls below it. It is distinguished by larger flowers of a purer white, and larger intense dark-green leaves. Native of Austria.

H. olympicus (*Olympic H.*)—This species is nearly related to the first mentioned, that form being accounted by some only a variety of the present subject, and appearing in many trade catalogues as *H. olympicus*, var. *ruber*. They differ, however, very essentially in the colour of the flowers, which in the present species are greenish white, and appear about a month earlier than those of *atrorubens*; but they have the same habit, and the same delicate pale-green, lobed, leathery leaves. Native of Bithynia.

Hepatica.—This small genus is nearly related to Anemone, and the few species it contains are by some authors included in that family. They are, however, practically distinct from any anemone with which we are familiar in cultivation, especially in the evergreen peculiarly-lobed leaves, and in the floral leaves, which are so close under the flowers as to assume the appearance of the calyx. Though few in species, it is one of the most important and valuable of spring-flowering genera. The species are all spring-flowering; all are beautiful and bright, and most profuse and continuous in the production of their flowers. They are invaluable for the embellishment of

beds, borders, and rockwork in spring; few spring-flowering plants, indeed, can compare with them when well managed as to culture and grouping. A rich rather gritty loam is most congenial to them, and they delight in slight shade, both foliage and flowers appearing freshest and to the greatest advantage so placed. They are propagated by division of the root-stock, and the operation is best performed in autumn, after growth has been made and the leaves are fully matured. When doing well they should be left alone, as they are very averse to frequent removals; but the crowns are apt from annual increase to rise too high above ground, and when such is the case they are benefited by being lifted and replanted, introducing a little fresh loam or leaf-mould about the roots in the operation, and taking care to bring the crowns nearly level with the surface of the ground. They should be annually refreshed by means of a little old thoroughly-rotted dung pricked into the surface of the ground around them with a fork; but digging, or deep stirring as with a spade, is objectionable. The best time to do this manuring is in spring, just as growth commences. In cases where the summer flower-garden must be filled with spring-flowering plants after removing the summer occupants, the *Hepaticas* are best managed by being kept in pots in the reserve ground.

H. angulosa (*Five-lobed H.*)—This is the finest of the species. It forms luxuriant tufts about 9 inches high of pretty, five-lobed, hairy leaves, from among which the large sky-blue flowers come forth in great profusion in March and April. It is not nearly so well known in gardens as its great beauty and spring-flowering quality entitle it to be; but it is yet comparatively rare even in the trade, and consequently rather high-priced. Native of North America.

H. triloba (*Three-lobed H.*)—This is the most common species, and there are few places in the country where spring flowers are in request in which a greater or less number of its beautiful varieties do not appear. They are all distinguished by the three-lobed leaves, and the flowers, single or double, being smaller than those of the preceding species. All the varieties are worth cultivating, and all except the double blue are cheap and plentiful. The following list enumerates all the varieties at present known:—*cærulea*, single blue; *cærulea pleno*, double blue; *alba*, single white, with red anthers; *nivea*, single white of snowy tint, and white stamens; *rubra*, single red; *rubra pleno*, double red; *carnea*, single pink; *Barlowi*, single mauve or light-red purple. Flowers in February, March, and April. Native of Europe.

The species *acutiloba* and *Americana*, as offered in some lists, do not present anything superior or very distinct from those above named for the purposes of decoration. Their flowers are blue, and the habit and time of flowering the same as the others. They are probably only one species, differing somewhat in the form of the lobes of the leaves.

Pæonia.—In this genus there are many plants of bold and striking character; their immense flowers, conspicuous at a long distance, giving many glowing intense shades of colour, and their distinct and generally excellent habit, mark them out as very valuable among herbaceous plants. There are depreciators of Pæonies who take exception to their large and not over-well-dressed flowers, and call them vulgar; but they are only vulgar when they occupy an unfit position, as when flaunting in a narrow cramped border, or in a villa garden or cottager's plot. Their beauties are fit only for producing distant effects, and they should be planted only where the sense of space is large, and always in association with masses of foliage, as of trees and shrubs. They prefer a somewhat shady position, as on the margins of woods and in glades; their flowers last longer thus: and when planted in masses in such places, so as to be seen from a distance, their characteristic glare is subdued, and the effect beautiful. They may be used with excellent effect, also, to embellish the banks of lakes and running streams at infrequent intervals. Only a few of the species have been productive of useful varieties, and the greater part of such are merely accidental, not the result of direct endeavour to improve their qualities; and considering how excellent many of these are, there is strong encouragement to florists to make many of the species the subject of direct experiment. Any good deep loam is agreeable to them; they are not fastidious as to quality, provided it be not too wet. Propagate the herbaceous species by division of the roots, and the Moutan sorts by cuttings in slight heat in spring, when the young shoots have hardened a little at the base, and by layering and division also, and by grafting on the roots of the herbaceous species. New varieties are raised by seed, which should be sown as soon as ripe, as they lie long. A proportion of the plants may appear the following spring, but the majority will lie dormant twelve months or more, and they lie the longer if the seeds are not sown immediately they are ripe. The Moutan varieties are not so hardy as the herbaceous ones, and should not be selected for cold wet localities. They are capable of resisting cold in any degree likely to be experienced in our climate; but in unfavourable situations the flowers are often

damaged in the bud late in spring. They are very easily excited into growth; and for this reason, where frosts prevail up till a late period in spring, the position selected for them should be somewhat shaded and as dry as possible.

P. albiflora (*White-flowered P.*)—This species is the parent of a few useful showy varieties. They are mostly about 2 feet high, and are distinguishable also by the rather bold, smooth, three-parted leaves, the segments of which are deeply cut into oval lance-shaped lobes. Native of Siberia. A few of the best varieties are:—*fragrans*, with rose-scented flowers; *Humei*, double crimson; *Pottsii*, crimson, and rather taller than the standard; *Reevesii*, double pink; and *Whitleji*, double white.

P. decora (*Comely P.*)—In this species the leaves are three-parted, with oblong bluntish lobes, which are downy on the under side. The varieties are few, and all are purple-flowered. Native of the Levant.

P. Moutan (*"Tree Pæony"*).—Of this species there are many striking and beautiful varieties in cultivation. All are easily distinguished from the herbaceous species and varieties by their shrubby stems. The flowers are of immense size and generally splendid colour. Where the climate is favourable for the development of their flowers out of doors, they produce a magnificent effect. They are very ornamental, also, in the cool conservatory in spring, either planted out or in pots, and are easily forced for the purpose of decorating rooms and plant-houses. The following are a few of the best:—*albida-pleno*, double-white; *Anneslei*, pink; *carnea-pleno*, double pink; *pieta*, variously striped in different shades of pink; *rosea-pleno*, double rose; and *salmonæa*, pale salmon.

P. officinalis (*Officinal P.*)—This species is near in character to *P. albiflora*, but is distinguishable in most of its varieties by rather taller growth and less equally-lobed leaves. It has been productive of many very showy varieties of greater or less distinctness. Native of many parts of the south of Europe, and widely spread over central Asia, and also a naturalised subject of our own flora, having been found, in the variety named *corallina*, in the Steep Holme Island, in the Severn. The following are a few of the best varieties:—*anemoniflora*, double red; *aureo-limbata*, a novel sort, of recent introduction, the flowers large, deep crimson, fashioned like a gigantic anemone in the centre, and the outer petals margined with yellow; *carnescens*, large pinkish white; *rubra*, deep red; *Sabini*, deep crimson.

P. paradoxa (*Purple P.*)—The leaves in this species are three-parted, and much cut into many bluntish lobes with wavy

margins, and hoary and downy beneath. Height about 2 feet. Flowers purple. Native of the Levant. It has not been prolific in varieties, and all are purple-flowered. The most marked is *fimbriata*, which is conspicuously fringed.

P. tenuifolia (*Fine-leaved P.*)—This is one of the most distinct of herbaceous Pæonies. It is rather dwarf, rarely more than 1½ foot high. The leaves are much parted, and the segments are divided in numerous thread-like lobes. The flowers are deep crimson, and not of the largest size, but the double form is very compact and handsome. It is one of the best of Pæonies, and worthy of a place in any select mixed border, and is quite congruous and elegant in small gardens. *P. tenuifolia*, var. *pleno*, is the only variety it has produced worthy of note. Native of Siberia.

All herbaceous sorts enumerated above bloom about June; the *Moutan* varieties in April and May.

Ranunculus.—This is a well-known and very numerous genus. It is popularly regarded as a weedy family, and if estimated on the merits of the few species of buttercups so abundant in most parts of the country, there is no doubt but that it is very weedy indeed. But the splendid varieties of *R. asiaticus*, and other perhaps less splendid but not less useful species, establish its claims to be considered one of the most ornamental groups of this very ornamental order of herbaceous plants. But the species yielding ornamental varieties are few in number when compared with the large gathering of weedy ones that are grouped along with them. Notably the varieties of *asiaticus* eclipse all others in splendour of colouring and symmetry of form; but they are troublesome to cultivate—a fact which will more than anything else prevent their occupying the undesirably exclusive position in the affections of florists they once did, in times when affairs of all kinds were more leisurely and easy-going than they are now. They can, however, be cultivated at less cost and trouble in attention and labour than it was thought possible in their petted days. If we are to believe the books and florists' directories, no less dainty food than turf off the best yellow loam, which must lie in store and be turned monthly for twelve months, could be presented to the luxurious Ranunculus. Excellent food this for almost any plant, if it could be obtained; but in most cases that is difficult, and in very many quite impossible. It is not necessary, however, for the ordinary purposes of embellishment and display, to attempt so expensive a method of treatment as that recommended in most treatises on the cultivation of the Ranunculus. Any strong

but friable loam is suitable for them, but it must be well manured in order to have strong growth, on which depend the excellence and abundance of the bloom. They may be planted in beds of one colour or of various colours, or in clumps of a few roots, as taste and circumstances may direct. The beds and clumps may be prepared for planting by deep trenching, turning in, in the operation, a liberal supply of old well-decomposed dung, at the depth of 6 or 7 inches from the surface. This should be done, in favourable weather, some time before planting-time. The roots may be planted in October, November, December, January, and February; but for most localities February will be found the best month, as the after-culture from that time is, on account of the gradually-improving weather, more simple and easy as regards both attention and labour—a consideration of much importance to amateurs, and all who must, from necessity or choice, cultivate their own gardens. When the ground is tolerably dry, a fine day should be chosen for planting. The beds should be 4 feet wide, and the surface raked fine and level before proceeding to plant the roots. A line should then be stretched lengthwise on the bed, 6 inches from the edge, and a neat trench cut along it about 2 inches deep. A little clean river or pit sand should then be strewed into the bottom of the trench, and the roots pressed firmly on the top of it, claws downwards, and about 4 or 5 inches apart. Finish the line by drawing the earth removed from the trench back on the top of the roots, making all firm and smooth again with the rake. Stretch the line again 6 inches from that finished, and proceed in the same manner till the bed is filled. In the case of clumps the operation of planting is the same essentially, but it is more convenient to remove the surface to the depth of 2 inches and the breadth to be planted, and place the roots in circles 5 inches apart each way, marking the spot by means of a tally or stake fixed in the centre before the roots are planted. A cool moist situation should be chosen in which to cultivate them; and after the leaves begin to appear, the ground should be kept very firm about them—treading may even be necessary in cases where the soil is of a light, soft texture; and a mulching of old manure, put through a coarse sieve, should be equally laid between the plants, in order to prevent cracking of the surface from drought. Water when drought is severe, if necessary, but do it thoroughly and carefully, taking care to prevent it falling heavily on the plants. If frost should occur after the foliage has appeared, some protection will be needful; a few hoops may be stretched across the bed for this purpose, on which to fasten a mat or other

handy covering. The roots must be lifted as soon as they are ripe, which is ascertained by the dying off of the leaves after flowering is over, and dried and cleaned carefully and slowly in a moderately airy place, and then stored away in a cool room till planting-time again comes round. They are propagated by increase of the tubers annually, and by seed. Seedlings are not difficult to raise, but on economical grounds the purchase of flowering roots is preferable. The seedlings bloom the following year from seed, and cost some trouble during the earlier stages of their progress; but it is only by means of seed that new varieties can be produced. The seed should be sown about the end of February in good rich soil, but without manure, in shallow pans or boxes, kept in a cold frame. Cover the seeds lightly, and sow thinly, and water gently before closing the frame, and keep close till the plants appear, and protect from frost till all danger of it is past. Give plenty of air after the plants have made some progress, when the weather is favourable, and in the end of May turn them out of doors in a sheltered warm situation. The only attention they will require till they begin to mature is watering and keeping clean, after which water should be gradually withheld till they are quite dry, when they may be taken up and treated in the same manner as the older roots. All tuberous-rooted species are propagated by annual increase of tubers and by seed, and the fibrous-rooted by division in autumn, winter, or early spring.

R. aconitifolius flore-pleno (*Fair Maids of France, or Bachelor's Buttons*).—This is one of the best known of hardy herbaceous plants, and enjoys a very liberal share of the patronage of cottagers and amateurs throughout the country, but is not often seen in gardens of larger extent. It grows about 18 inches high, with graceful free habit; dark-green, handsomely lobed and toothed leaves, and a profusion of beautiful pure white flowers, very suggestive of buttons, but only remotely so of bachelors; very ornamental in the mixed border, about the margins of beds of shrubs, and on rockwork, and may be introduced successfully into open woods where the natural vegetation is not of a rank character. Flowers in May and June. Native of the Alps of Europe.

R. acris flore-pleno (*Yellow Bachelor's Buttons*).—This sort is better known in the single state than in the double, being plentifully distributed in pastures throughout the country. It grows about 18 inches high, with pale-green hairy lobed leaves and upright stems, branching into numerous panicles of bright-yellow flowers, very double, in the form of those of the preced-

ing, but rather smaller. It is a very free and continuous blooming plant, and worthy of a place among the most select mixed border-plants. Flowers from the end of June till the end of August.

R. asiaticus (*Common Garden Ranunculus*).—The varieties of this species have already been somewhat remarked upon. They are very numerous; ancient florists used to boast that *R. asiaticus* was more numerous in varieties than all other flowers. They are not so now, and the trade in named sorts is very trifling; the demand is more for colours separately and in mixture than for fine named sorts. The colours are exceedingly various, and the modes of arrangement of the colours nearly as varied as the colours.

R. bulbosus flore-pleno (*Bulbus Buttercup*).—The original of this form is also a native of Britain, though not so plentiful, especially in Scotland. It grows about a foot high, having the stems thickened at the base into a bulb-like process. The leaves are small, divided into three lobes, which are much cut. The flowers are produced in less profuse panicles than those of *R. acris*, but are rather larger, and bright yellow.

R. gramineus flore-pleno (*Grass-leaved Buttercup*).—This is a very distinct and pretty plant, well worth a place in the mixed border or on rockwork. It grows from 9 inches to 1 foot high; the leaves mostly proceed from the roots, and are grass-like in form, and pale glaucous green. The stems are slender but erect, and almost leafless, and produce a few beautiful golden-yellow double flowers. Flowers in April and May. Native of Europe.

R. aquaticus (*Water-Ranunculus*).—There are many forms of this species found in ditches, streams, ponds, and marshy places in Britain. It is the large-flowered floating variety, not so commonly found in nature as some of the others, that I would recommend here. In it the flowers are white, borne on large stalks, and the leaves are all submerged, and very delicately cut into long parallel segments. The manner in which the leaves are cut distinguishes it from another variety with the leaves finely divided, but in which the segments spread irregularly in all directions; both are very ornamental in water. The first noticed affects running streams in nature, and would be most at home in such in cultivation; the other is more generally found in deep still waters, and would be most useful for introducing into ponds and lakes; but both are alike useful for the latter purpose. They flower from very early summer till very late. There are many very interesting alpine species suitable

for the rockwork only, but those enumerated are the best of the family for general ornamental purposes.

Thalictrum (*Meadow-Rue*).—This genus comprises many forms characterised by rather slight distinctions in a large majority of cases. The stamens are the most conspicuous organs in the flowers in all except a very few species, and the prevailing colour is greenish white, but the flowers are produced in dense panicked masses, and continue in effect for a considerable time. Meadow-rues are not, however, plants of a select character as regards their flowers, but some few of the smaller-growing species are marked by foliage of a most graceful kind, rivalling in delicacy of form and colour some of the charming maiden-hair ferns. They are valuable, therefore, for many ornamental purposes, both in association with flowering plants and with plants of fine or characteristic foliage. They all succeed well in any ordinary good garden soil, and are propagated by division of the roots in winter or spring, and also by seeds sown out of doors in March in well-dug soil broadcast. The seed of *T. minus*, in order to have well-established plants by the end of May, if it is contemplated to use it in bedding-out, should be sown in gentle heat early in March, and the plants pricked out in shallow boxes filled with light rich earth, growing them on under generous treatment, and gradually hardening them off before planting-time.

T. aquilegifolium (*Columbine-leaved Meadow-Rue*).—In this species the stems rise to the height of about 4 feet, clothed with abundant foliage, and branching into many lateral and terminal panicles of greenish or creamy-white flowers. The leaf-stalks are several times divided, and the leaflets are large, dark green, with a slightly glaucous hue, and oval in shape, and toothed. This is one of the best and most distinct of the taller forms. There are two or three varieties; the best is *atropurpureum*, in which the stems and leaves are dark purple, with a sub-glaucous tint. Flowers in May, June, and July.

T. anemonoides (*Anemone-like Meadow-Rue*, syn. *Anemone thalictroides*).—This is a very interesting species. It grows about 9 inches high, with graceful glaucous leaves, and little panicles of pretty white flowers, in which the sepals are more conspicuous than the stamens, and are petal-like. Best adapted for cultivating on rockwork in deep moist soil and partial shade. A double-flowered variety is in cultivation, and may be preferred to the single one. Flowers in April and May. Native of North America.

T. flavum (*Yellow Meadow-Rue*).—This species grows about

3 feet high; the leaves are very deep green, divided two or three times, and the leaflets are wedge-shaped. The panicles of flower are compact and numerous, and the flowers are bright orange-yellow. One of the most showy species, suitable for mixed borders and planting among shrubs, and for naturalising by the banks of lakes and streams, luxuriating most in moist situations. Flowers in May and onwards till August. Native of Europe and Russian Asia, and also of Britain, but rather thinly distributed.

T. minus (*Lesser Meadow-Rue*).—As regards foliage, this is the most elegant of Meadow-Rues, and might happily be named Maiden-hair Meadow-Rue. The leaves are divided in the same manner, and have a striking resemblance to the fronds of *Adiantum cuneatum*; and the plant may, with equally beautiful effect, be used for similar purposes in the open air to those for which the *Adiantum* is employed indoors—that of furnishing grace in association with colour, and producing contrasts of form and colour in foliage and habit. It grows about a foot high, producing dense masses of the leaves already alluded to, in rounded graceful tufts. The panicles of flowers are loose, and rise considerably above the mass of the leaves, and are greenish white, tinged with pink; but they should not be allowed to develop themselves when the object in view is the foliage effect. The flowering-stems in that case must be pinched out as soon as they appear, and attention to this will afterwards be necessary, as the plant will make subsequent efforts to flower. Flowers in June and July. Native of Europe and Russian Asia, and, though not common, is also indigenous to Britain.

Trollius (*Globe-Flower*).—A small genus of plants, but all having some considerable pretensions to beauty and usefulness as hardy border-plants. They are dwarf compact plants, and look very trim and pleasing in the mixed border. In their native habitats they affect moist woods and upland pastures, and in cultivation luxuriate most freely in good rich loamy soil in moderately moist somewhat shady places. They would doubtless prove excellent subjects for naturalising in open woods, where no more rampant plants than themselves existed in the natural vegetation. They are all slightly odorous, especially in the process of drying, and on this account it is said the people of Sweden gather quantities of the flowers of *T. europæus* and strew the floors and doors of their houses with them in holiday times. They are propagated by division in autumn, winter, and spring.

T. americanus (*American Globe-Flower*).—This is one of the dwarfest species, growing about 9 inches or 1 foot high, with pretty palmately-divided leaves and yellow flowers, the sepals

or coloured calyx-leaves spreading. Native of N. America. Flowers in May, June, and July.

T. asiaticus (*Siberian Globe-Flower*).—This species grows about a foot high, with leaves similar to those of the last, which are characteristic of all the Globe-Flowers; and the sepals, about ten in number, are dark orange and spreading. Flowers in May, June, and July. Native of Siberia.

T. caucasicus (*Caucasian Globe-Flower*).—This species grows about 18 inches high, with large bright-yellow flowers, the sepals in which assume a more globular form than in the two preceding species. Flowers in May and June. Native of the Caucasus.

T. europæus (*European Globe-Flower*).—A handsome species, growing about 2 feet high, with large lemon-coloured very globular flowers. Native of central and southern Europe, and found also sparingly in Britain. Flowers in May, June, and July.

T. napellifolius (*Napellus-leaved Globe-Flower*).—This species is nearly allied to the last, but easily distinguished from it by the deep yellow and less compactly globular flowers. Flowers in May, June, and July. Native of Europe.

BERBERIDACEÆ.

This natural order of plants comprises only a very limited number of herbaceous genera, and none of these may be considered plants of showy character; for, unlike the majority of the shrubby species, they are more remarkable for their curious structure than for striking beauty. The most important herbaceous genus is *Epimedium*, for the purposes of ornamentation: in it there is a very happy union of grace in habit and foliage and beauty, as well as high interest in the flowers. *Jeffersonia* is perhaps the only other genus that may be admitted into collections other than botanical, and it should be in every collection of choice beautiful plants, being at once both curious and handsome. The culture of these two genera must be the same. They succeed best in sandy loam and peat of considerable depth, and all the better if moist, though perfect freedom from stagnation must be secured, and they prefer a little shade; but that is of less consequence than a properly-constituted soil. In the mixed border they form elegant objects for the front lines, and they are very fit also for rockwork, especially where the natural soil is unfit for them—that is, heavy loam or clay.

Some of the *Epimediums*, being evergreen, are well adapted for furnishing the margins of beds of shrubs, their dwarf elegant mode of growth bringing about a very pleasing gradation from the shrubs to the ground edge, be it grass or box and gravel. Once established in stock, and while doing well, these plants should not be disturbed by annual deep diggings and transplantings; they dislike being much moved once they are established in a place; and only when they begin to decline, or when it may be necessary to increase stock, should they be moved. Division is the best mode of increasing these, and it is best done, especially in counties north of the Tweed, in early spring, just as activity begins to show itself returning. Of other herbaceous genera of this curious and interesting order—*Caulophyllum thalictroides*, with yellow and very fugaceous flowers, from N. America, and *Diphylleja cymosa*, with white flowers, also from N. America, and in both which the leaves are produced twin-fashion—there is little seen even in botanical gardens in this country, and they are decidedly more curious than beautiful; fit subjects for botanical collections, in fact. They require the same conditions in culture as *Jeffersonia*, to which they are closely allied.

Epimedium.—This family contains three or four distinct and pretty species, some or all of which should be cultivated in every collection of hardy border-plants. They are hardy, elegant plants, adapted to any purpose to which herbaceous plants may be turned.

E. alpinum (*Alpine E.*)—This is one of the most elegant and interesting, though not the showiest, of the group. It grows in graceful rounded masses, a foot or more high, with elegant compound leaves on slender hard smooth stalks, with lively green heart-shaped leaflets, bronzed and rigidly ciliated on the margin. The flowers in long loose racemes spring from the leaf-stalks an inch or two below the primary divisions of the leaves, are small, reddish brown, with curious spurred yellow and rather inconspicuous corollas.

E. macranthum (*Large-flowered E.*)—This is the finest of *Epimediums*, and a very handsome and interesting plant. It is less vigorous in growth than the last species, growing from 6 inches to 1 foot high, with leaves of the same structure and general form, but smaller, and usually bronzed and shining in the early stages of growth; the margins ciliated and the stalks slightly hairy. The flowers are white, tinted with purple; and the petals, about an inch long and four in number, are pure white, transparent, and are the most conspicuous feature in the flower. The flower-stalks carry the flowers slightly above the

bronzy foliage, and the effect produced is charming. Flowers in April and May. Native of Japan, but quite hardy.

E. pinnatum (*Pinnate E.*)—This species grows about the same height as the large-flowered E., with smaller leaflets supported on more slender stalks. The flowers, borne in rather dense racemes, are yellowish, and appear in April and May. The variety named *elegans* is the best, and is a very desirable plant for partially-shaded borders. Native of Persia.

E. violaceum (*Purplish E.*)—The leaflets in this species are narrower in proportion to the breadth than in the last two species. The flowers are white, tinted with pale purple, and appear in April and May. By some this is regarded, and not without reason, as a variety of the large-flowered E.; the stature and habit in both forms are nearly the same, and in other respects they are not markedly distinct for the purposes of decoration. Native of Japan.

Jeffersonia diphylla (*Twin-leaved Jeffersonia*).—This, so far as I am aware, is the only species. It is not deficient in beauty, the flowers being large, abundantly produced when well cultivated, though individually somewhat fugaceous. The flowers, as has been said, are large, about an inch across, white, with conspicuous yellow stamens; and the leaves are curiously produced in single pairs at the extremity of the stalks. It is a native of moist shady woods in N. America, and is best adapted for culture in semi-shady places in deep rich peat and loam freely mixed with sand. Under such circumstances it attains its greatest perfection; but I have seen it very beautiful and interesting, but short-lived in its display, in the light sandy soil of the gardens at Kew, and in a southern aspect. It is a plant rarely seen in private gardens, and not always to be met with in botanical gardens in this country; but it is worthy a place in every garden, if the conditions necessary to its wellbeing can only be secured.

NYMPHÆACEÆ.

The members of this order are all aquatic or marsh plants. It is an order of the grandest interest and beauty. All the world has rung with the praise and fame of the regal Victoria, the noblest of Water-Lilies; and the sparkingly-beautiful species and varieties of the tender Nymphæas are plants of the loveliest type. Although an attempt or two has been made, and

attended with some success, to cultivate the Victoria in the open air in tanks of water artificially heated, we must not claim the wonderful plant as a hardy subject in this country; and it is scarcely possible, even though, for the purposes of sensation, it may appear desirable, to cram the representatives of the genera of every clime into the cramped limits of our little but glorious isle. Our efforts in making such a universal *omnium gatherum* of plants would be only less ridiculous and dangerous than the like on the part of the zoologists with animals. It would undoubtedly be sensational to have the lion or the tiger pricking up one's senses by a growl or a spring from the hedge by the wayside; but the beauty or the comfort of the thing would be questionable, at least to mortals of ordinary nerve. We have no need, however, to attempt naturalising the lions of the vegetation of the tropics, even though by artifice we could assure ourselves of success; there are plenty of the tamer but not less beautiful plants of temperate and northern climes, which, without either much trouble or expense, may be had for the various purposes that may be entertained in outdoor gardening in this country. Nuphar, scarcely less beautiful than Nymphæa, furnishes four or five hardy species of aquatics; and Nymphæa gives us about the same number, which may fairly vie with the most admired of the tropical species and varieties as seen in our stoves. These hardy Water-Lilies are very ornamental objects in lakes, ponds, and gently-running streams, and their culture is most simple. They are easily propagated by division in spring as growth commences, the only care necessary being to secure the plants to the position they are to occupy by some kind of anchor till they take root and fix themselves, which they quickly do. Seeds also may be used as soon as they are ripe; or, if the seeds have to be transported a distance, they should be put in small bottles of water, and kept cool. They are usually sown by being cast into the water where they are to grow; but a more certain way is to sow them in shallow pans or pots, and gently drop them into the water after they have been well wetted to prevent displacement of the seeds. The only care afterwards necessary is the prevention of injury by water-fowls or floods till the plants have made some growth, when they will care for themselves. No pricking off nor transplanting from the seed-pan is necessary in the method described; they quickly spread away from it, and root and extend freely in all directions.

Nuphar (*Yellow Water-Lily*).—In foliage and mode of growth this group does not differ essentially from the Nymphæas, but in the structure of the flowers there is an easily-recognised dis-

tingtion. In Nuphar, the parts of the flower—sepals, petals, stamens—are closely crowded on a raised fleshy disc surrounding the base of the seed-vessel; while in Nymphæa they are more loosely arranged, and spring direct from the base and sides of the seed-vessel; itself. There is, moreover, so far as I know, no hardy yellow-flowered Nymphæa, whereas all the hardy cultivated Nuphars are yellow-flowered.

N. advena (*Stranger Yellow Water-Lily*).—The leaves are deeply heart-shaped, with widely-spreading lobes; the calyx is usually composed of six sepals. Flowers in July and August. Native of N. America.

N. Kalmiana (*Canadian Yellow Water-Lily*).—The leaves are deeply heart-shaped, with spreading lobes, and the calyx has usually only five sepals. Flowers in July and August. Native of Canada.

N. lutea (*British Yellow Water-Lily*).—Leaves larger than in either of the foregoing, deeply heart-shaped, with overlapping lobes. The calyx composed usually of five sepals. This is the best known of the Yellow Water-Lilies, being a native of our own country, but found also in Europe generally, and in northern and central Asia sparingly.

N. minima, syn. **N. pumila** (*Smaller Yellow Water-Lily*).—This is regarded as a diminutive variety of the last species. It is found in some of the mountain-lochs in the N. of Scotland, and differs from the species only in respect of size, and would be found more suitable for shallow waters and the margins of deeper lakes.

Nymphæa (*White Water-Lily*).—The petals, being numerous, and inserted on the side of the seed-vessel in a freer manner, give the flowers a more graceful appearance than those of Nuphar have. Few objects are more graceful and interesting than well-cultivated Nymphæas, and our own British Water-Lily is scarcely inferior to those of the tropics. It should be cultivated in every piece of water in the country, where ornament is an object.

N. alba (*Common White Water-Lily*).—This is our native species, and it enjoys rather a wide geographical range over Europe and central and northern Asia. The leaves are deeply heart-shaped, the lobes overlapping. Flowers in June, July, and August.

N. nitida (*Shining-leaved White Water-Lily*).—The leaves are roundish-oval, heart-shaped; the lobes open, deep, and spreading. Flowers in July and August. Native of Siberia. Not often seen in gardens in this country, but worthy of extensive favour.

N. odorata (*Sweet White Water-Lily*).—A North American species, of which I have no experience in the north, but which succeeds well along with other hardy Water-Lilies in southern counties. The leaves are round, deeply heart-shaped, with open spreading lobes. Flowers in July and August.

PAPAVERACEÆ.

This order does not include many plants of much ornamental value. It is far more famous for its medicinal qualities than for floricultural importance, yet it includes not a few plants remarkable for producing large strikingly-showy flowers, some indeed imposingly brilliant, and handsomely-formed or interesting leaves. The flowers, however, in most cases, are of a somewhat fleeting character, but it should be stated that many of the best produce a very prolonged succession of bloom, which handsomely compensates for the brief duration of individual flowers. The larger number of the species are either annual or biennial plants, and do not therefore invite our attention at present; but some of the perennials are so distinctive and handsome in character, that, notwithstanding the short duration of the flowers, no really good collection of hardy perennial plants can be considered complete without a few of them in its ranks, and only a few of the best are here selected. As a rule, all the Papaveraceæ luxuriate best in light rich gritty loam; but the soil should be well drained, whatever its texture or components may be. Propagation is effected by division in spring, or by seeds. The latter method, in the majority of cases, is the best, because, owing to the thick fleshy root-stock which most of the larger-growing Poppyworts form, division is not always a safe or successful process. Sow the seeds in March, in small pots, in a cold frame or in slight heat. Only two or three seeds may be sown in each pot. It is characteristic of the order generally that the plants at first make only a tap-root, which, when broken—and it is not easily avoided in the process of pricking off, should it be necessary to resort to it—does not readily emit fibres or repair itself; it is better, therefore, to sow very thinly in small pots, and afterwards to thin away the weaker plants, leaving only one or two of the strongest to occupy the pot, and be potted on if necessary, before finally turning it out into the place it is to occupy in the open ground.

Chelidonium (*Celandine*).—This is one of the most free and continuous-flowering genera in the order. It is not of the most showy description, but is always interesting and pretty. It succeeds best in partial shade, and is useful for introducing into open woods and naturalising on shady banks where the vegetation is not of too encroaching a nature. Propagate by seeds in the open ground in March—the double form by division in spring, or both by the latter means.

C. majus (*Larger Celandine*).—It is not so much for the species in its normal form that this plant is selected, as for two varieties of it of more value than itself, floriculturally speaking. The one is *C. m. flore-pleno*, a double-flowered variety, differing only from the simple form of the species in that particular. It grows about 18 inches high, in soft rounded outline, producing pale-green pinnately-divided leaves. The flowers are numerous, consisting in the simple form of only two sepals and two petals, but in the double variety the petals are indefinitely increased. The other variety is *C. m. variegata*, and is distinguished from the species by having the foliage marked with creamy yellow. There is also a white-flowered variety, which may not be considered much of an acquisition where the others are cultivated, and there are a number of botanically interesting varieties, the species being of a variable nature. Flowers from April and May till October. Native of Britain.

Meconopsis.—This is a very interesting and beautiful genus. The species are few in number, and, with the exception of the first of the two selected, are very rare plants in cultivation. They delight in a rich, light, sandy loam, and succeed best on rockwork in partial shade. Propagate by division or by seeds in spring: the latter method is the best, and most certain of keeping up stock, especially of the last of the selected species.

M. cambrica.—This species grows erect, about 1 foot high, with pinnate, pale-green, slightly hairy leaves on long stalks, the segments deeply cut. Flowers on long stalks, large, pale yellow. Flowers from June throughout the summer. It must have a good depth of soil on rockwork, but well drained, and be well supplied with moisture in the growing season. Native of western Europe, also Ireland, Wales, and western counties of England.

M. Wallichii, a species of grand interest and beauty. It grows erect, 3 or 4 feet high, the stems and leaves somewhat glaucous, and densely clothed with long rusty hairs. The lower leaves are 9 inches or a foot long, and stalked, but diminish in size, and ultimately become stalkless as they ascend the stem. Flowers large, pale blue, nodding on short stalks,

and arranged in long terminal leafy racemes. Flowers in July, and throughout the remainder of summer and early autumn. Native of Sikkim Himalaya. It is with some diffidence I recommend this grandest of *Meconopsis* as a hardy herbaceous perennial. Some eighteen or twenty years ago it was first introduced into this country, and flowered at Kew, but died immediately after. Once again, eight years subsequently, it was grown at Kew; and the stock raised from the imported seed was considerable, and was distributed among several botanic gardens in this country, a few being reserved for culture in the herbaceous department at Kew. Three or four of those reserved were cultivated under various treatment—in pots in a cold pit, in the open ground along with other Papaveraceæ, and in a small reserve ground attached to the herbaceous department, intersected with hedges; and here it was grown in pots plunged in the soil, and also planted out—shaded, and also exposed to the mid-day sun. The measure of success was greatest in the last-mentioned circumstances, and least in the pit. The plants in pots plunged in shade were by far the most vigorous, and flowered beautifully; but in every case the plants began to show symptoms of decay as flowering ceased, and they ultimately died much in the way of biennial plants when their mission is fulfilled, and without leaving seed by which to make a fresh start the following season. I was not so fortunate as to hear the nature of the result at a few places to which the surplus plants were sent; but having heard nothing since of so interesting a plant, I am obliged to conclude that no greater success attended its culture elsewhere than that just described. Whether biennial or perennial, therefore, is a problem yet to be solved; but in either case it is a splendid and interesting plant.

Papaver (*Poppy*).—This group is a large one, consisting mainly of annual and biennial, and a few perennial species. A small selection of species only is needed to embrace the best and most distinct. The taller-growing species are best adapted for ornamenting the back lines of mixed borders and for planting among shrubs to give colour, in which latter position they produce a very fine effect. The dwarfer species are suitable and elegant ornaments for rockwork, or for the front lines of mixed borders in moderate shade—that is, their beauties are longer enjoyable in a somewhat shady position than in one fully exposed to the sun. They are propagated by division, and by seeds in spring.

P. alpinum (*Alpine Poppy*).—This is a beautiful dwarf-growing species, producing handsome pinnately-divided leaves somewhat glaucous, and a profusion of leafless, roughly hairy

stems, each supporting a solitary, large, bright-yellow flower. Flowers in June, July, and August. Height about 1 foot. Native of the mountains of Austria. A variety named *P. a. miniatum* is very beautiful; the flowers are pale yellow in the centre, shading into deep orange-red on the margin.

P. bracteatum (*Great Scarlet Poppy*, syn. *P. pulcherrimum*).—This is a splendid tall-growing species, producing dense rounded masses of long pinnately-divided leaves, roughish to the touch above and below. The flower-stems are almost leafless, very rough to the touch, and rise to the height of 3 or 4 feet, supporting each an enormously large bright orange-scarlet flower, the petals and sepals marked at the base with a large intense dark-crimson spot. Flowers in June and July. Native of Siberia.

P. pilosum (*Hairy Poppy*, syn. *P. olympicum*).—A very handsome species, producing large orange or brick-red flowers, the sepals and petals being marked at the base with a dull white spot. Flowers in May, June, and July. Height about 18 inches. Native of Greece. Best adapted for culture on rock-work.

P. pyrenaicum (*Pyrenean Poppy*).—A most interesting and beautiful diminutive species. It forms dense prostrate masses of foliage, above which it throws its beautiful, large, orange-yellow flowers an inch or two. It is a choice ornament for rockwork, and should have a moist but well-drained position. Flowers in June, July, and August. Height 6 to 9 inches. Native of the Pyrenees.

Sanguinaria (*Puccoon*).—This is a pretty genus, comprising only one species. It is not uncommon in many gardens in the country, and should be more generally cultivated than even it is. It grows freely in almost any good garden soil, but prefers light, rich, sandy loam. Propagates readily and successfully by division in autumn or spring.

S. canadensis (*Canadian Bloodwort or Puccoon*).—This is an interesting and pretty spring-flowering plant. The leaves grow rather erect, are dark green and sub-glaucous above, and almost hoary beneath. The flowers on short stalks are white with a tint of pink, and are very profusely produced in March and April, or later, according to season and locality. Height from 6 to 9 inches. Native of North America. The variety named *S. c. major* or *grandiflora* is the best, being a more robust plant, with larger flowers. Succeeds in any position, open border, bed, or rockwork, but lasts longer in a somewhat shady place than in one more exposed.

FUMARIACEÆ.

This order, though comparatively limited both as regards genera and species, contains some very brilliant and elegant ornaments of our flower-gardens. We need only to remind ourselves that the peerless *Dielytra spectabilis* is a member of the family, in order to invest it with the highest character for grace and beauty. And it is not alone in its glory: lesser lights they may be that shine around it, but there are plants among its kindred only less charming than itself, that may fitly be associated with it and other spring and early summer flowering beauties in our gardens. Only the two genera, *Corydalis* and *Dielytra*, present hardy perennial species worthy of cultivation in select collections. The *Dielytra spectabilis* is the best known of all the cultivated perennial plants in the order; certain other handsome species of *Dielytra*, and the various forms of *Corydalis*, are not so commonly found in private collections of hardy plants as might be expected, both on account of their beauty and the early-flowering habit of most of them. They are all admirably adapted for the gardens of amateurs, where limited space and large desires have to be considered in the selection of subjects for cultivation. They grow freely in any good garden soil if not too wet and heavy; but even in clayey soils, if thoroughly well drained, *Dielytra* at least succeeds very fairly. They may be used also for naturalising in open woods.

Corydalis.—This genus comprises about a score of species, which are easily divided into two sections by peculiarities of the root and stem. In one section the roots are fibrous, or consisting of a fleshy root-stock, dividing itself ultimately into fibres, and the stems are branching more or less, and these are mainly annuals or biennials, and such perennials as are so distinguished are not so valuable for ornament as the larger portion of the other section. In the other division the peculiarities are tuberous roots, the leaves mostly radical or proceeding direct from the roots, and the stems unbranched. These peculiarities require different treatment in the matter of propagation. The fibrous-rooted are best produced from seed: they may be propagated by division, too, in spring; but if left alone they usually reproduce themselves, as they seed freely, and germinate equally freely, without any special conditions. The tuberous-rooted are not quite so free in seeding, but provide ample means for increase in the annual formation of tubers. The genus is more partial to light gritty soils than to those of

closer texture, and they generally prefer a position slightly shady. They are beautiful ornaments of rockwork.

C. bulbosa, *syns. C. solida* and **Fumaria solida** (*Bulbous C.*)—The roots are tuberous, as indicated in the specific name; the stems are unbranched, and the leaves much divided in the ternate manner. Flowers pale purple or pink, in terminal compact racemes, appearing in February or later, according as the season is mild or severe, and lasting a couple of months. Height 9 inches. Native of Europe generally, and has been naturalised in a few places in Britain. May be cultivated in the open border or on rockwork, and is valuable for introducing into shady dry banks, and with a handful or two of soil will luxuriate among the debris of old ruins.

C. lutea (*Yellow C.*)—It is doubtful whether this is a true perennial, but as it reproduces itself abundantly by seed, the question is of less importance to the purposes for which it is best adapted—those of adorning ruins and old walls, and dry open woods and banks; and it certainly is more durable than most biennial plants. It belongs to the fibrous-rooted section, and produces branching angular stems clothed with ternately-divided leaves, the stems and branches terminating in short loose racemes of yellow flowers. Height about $1\frac{1}{2}$ or 2 feet in rich light soil, but much more dwarf when growing in dry gravelly or stony places. Flowers in spring and throughout the summer. Native of Europe generally, and of several parts of England.

C. nobilis (*Noble C.*)—This is perhaps the finest of the group, and is certainly a very choice and beautiful plant. It requires rather more generous treatment than most others of its relatives, luxuriating best in partial shade on rockwork, with a tolerable depth of soil of a rich but porous gritty nature. It belongs to the tuberous-rooted division, and produces erect unbranched stems, much-divided pale-green leaves, and dense racemes of bright yellow flowers. Flowers in May and June. Height about 9 inches or 1 foot. Native of Siberia.

C. tuberosa (*Tuberous C.*) is near in character to *bulbosa*, but has darker purple flowers. It is valuable for similar purposes, and the white-flowered variety, *C. t. albiflora*, is an indispensable companion to it in any position: it is synonymous with *Fumaria cava albiflora*. Flowers same time as *bulbosa*, and about the same in height. Native of Europe.

Dielytra is not so numerous in species as the preceding, but all are perennial plants adapted to a variety of purposes of embellishment. They grace any position in which they may be placed; and while they are at home in sunny exposures,

they are equally happy in and brighten up shady places with their handsome foliage and beautiful flowers. *D. spectabilis* even is not unwilling to flourish in groves and glades where some preparation as to soil is made for it, and encroaching neighbours may be kept in proper check. All the species luxuriate in such places. They do not flower so freely as when placed in sunnier positions, but their graceful foliage, with the beautiful flowers, if not profuse, are welcome because unlooked for and rare. Preparation for planting in these places consists in trenching the spot to be occupied by the plants to the depth of $1\frac{1}{2}$ or 2 feet, adding gritty sand, if the soil is of close consistency, and well-decomposed leaf-mould; and worthless native plants, if of a rampant nature, should be curtailed in the vicinity of the prepared ground. All are easily propagated by division in early spring on the first symptoms of growth appearing, or indeed at any time in open weather after the plants are at rest; but the largest possible increase may more safely be attempted when returning activity is first excited. It is pretty well known that *D. spectabilis* makes a beautiful pot-plant, and may be forced in gentle heat into flower for the decoration of conservatories and rooms some months before its natural period of flowering in the open air. *D. eximia* is very handsome done in the same way, but requires less excitement than *spectabilis*.

D. eximia (*Choice D.*)—This species grows about 18 inches high, producing rounded masses of bright green handsome leaves, the lobes of which are sharply cut. The flowers, flesh-coloured, are borne on long, graceful, leafless stalks, in loose drooping racemes, which in luxuriant plants branch at the base. Flowers in May, June, and July. Native of N. America.

D. formosa (*Handsome D.*)—This species is more dwarf than the last; the lobes of the leaves are more bluntly cut; the flower-stalks are naked, but the racemes are very short and crowded, and show less tendency to branch even when most luxuriant. Colour purplish pink. Height about 9 inches or 1 foot. Native of N. America. Flowers in June and July.

D. spectabilis (*Showy D.*) is so familiar to all lovers of flowers that a description of it would be superfluous. It will be enough to be reminded that it is the handsomest of its tribe, that it is not surpassed in brilliancy and grace by any known hardy perennial plant, and it is withal most easy to cultivate. Flowers in June and July. Native of Siberia.

CRUCIFERÆ.

This is a very interesting and extensive order of plants, more remarkable, perhaps, for the great importance and value of the food products it yields to man and beast, than for high ornamental qualities, though it comprises a large number of plants by no means deficient in that respect. The greater number of the ornamental species are comprised in comparatively few genera, and are mostly alpine or sub-alpine plants. Some very interesting and beautiful species, from peculiar habitats, are difficult to grow and keep under ordinary, or even extraordinary, conditions; but these have been avoided in making selections, and only such as will succeed with ordinary facilities adopted. Many of those selected are adapted to a variety of purposes; they will be found beautiful objects on rockwork, and for edgings and masses in the spring flower-garden; and the majority are available in a variety of soils for culture in the mixed border, while there are a few that will be found very useful for naturalising in woods and semi-wild places. The uses to which they may be applied, and the culture, will be noticed more particularly under the genera and species as they are severally considered.

Alyssum (*Madwort*).—This is rather a numerous group, composed of a few annual and biennial, and a majority of perennial species. The perennials are half-shrubby plants of humble growth, and evergreen to a greater or less degree; the flowers are small individually, but produced in dense masses and in long succession. They are plants of the easiest culture, succeeding best in light gritty loam of a rich quality, but doing very well in a great variety of soils and situations. The rockwork, mixed border, and borders of shrubberies, are all fit places for these plants, and some are qualified for naturalising, and will be noticed in their place. They are propagated by division in autumn and throughout winter and spring, but if done in early autumn there is no sacrifice of bloom, which is inevitable to some extent in the later periods; by cuttings also in spring and throughout the summer, inserted in sandy loam and leaf-mould under a hand or bell glass in a shady place, as behind a low wall or hedge. Cuttings, if early struck, make the most vigorous plants, and flower the strongest the following year; and a few should be struck annually in order to keep up a healthy and ample stock. This is especially necessary where they are to be largely used in filling up the beds of the summer flower-garden in the spring months; and stock of neat uniform

plants can only be maintained by this means. In this case cuttings may be taken to the extent required immediately before the summer occupants claim their quarters, and the old plants be turned on the rubbish-heap, or utilised in any other way.

A. argenteum (*Silvery-leaved Madwort*).—This is a compact-growing species, with small oblong leaves, broader at the point than the base, silvery on the under side, and dotted above with minute starry grey hairs. Flowers in dense panicles, yellow, appearing in April and May. Native of Piedmont and Corsica, in exposed rocky places. Best fitted for culture on rockwork, and succeeds but indifferently in the open ground, where the soil is naturally moist. Height 9 inches to 1 foot.

A. gemonense (*Austrian Madwort*).—This is a splendid sort, of shrubby diffuse habit, with large lanceolate leaves, hoary on both surfaces, the margin marked with a few obscure teeth. The flowers are produced in great profusion in April, May, and June, and are very conspicuous in masses at a distance, being bright golden yellow. This is the most valuable of all the spring yellow bedding plants, being superior to the ordinary form of *A. saxatile* in vigour, colour, and profusion of bloom. It grows well everywhere, and in a variety of soils, and is quite hardy, but prefers light dry loam. Where the ground is wet, little hillocks should be raised to plant upon, in order to secure immunity from the effects of stagnation. It may be naturalised on dry banks in semi-wild places with ease, if rabbits do not abound in the place; but need not be attempted if they do, as they are partial to the plant in a strong degree.

A. saxatile (*Rock-Madwort*).—Botanists are not at one with each other regarding the distinctness of this plant from *A. gemonense*, and the strongest opinion appears to be favourable to regarding the latter as a variety of the Rock-Madwort. The two forms are, however, quite distinct for horticultural purposes in large collections; but in smaller, only one may be recommended—and in that case *A. gemonense* should be preferred, as being the most beautiful, and adaptable to a greater variety of uses. *A. saxatile* is, however, equally well fitted for naturalising on dry banks and about the walls of ruins, where a little soil may be introduced for it to grow in. Height about 9 inches. Native of many countries of S. Europe and W. Asia. Flowers about the same time as *A. gemonense*. A variegated form of this species may or may not be considered valuable, according as taste in these things sways one. My own opinion is that it is worthless; the contrast between the hoary ground-colour and the creamy-white margins is not sufficiently distinct;

and the variegation has the effect also of depreciating the beauty of the flowers, which is very obvious when the two sorts are grown side by side.

Arabis (*Rock-Cress*).—This is a rather numerous family, and presents a greater variety of colour in its species than *Alyssum*; but I do not think a more extensive selection would be proper, for though easily-managed hardy plants, only two or three species are far enough removed from weediness to be admitted among ornamental plants. Those included in the following selection are very easily cultivated, thriving in most soils and in almost any situation. They are, however, most characteristic of rockwork; and even when grown in borders and other flat surfaces have the best effect when raised in hillocks. They are of more straggling growth, if *A. lucida* is excepted, than the *Alyssums*, and require a little more attention where trimness and smoothness of surface are required; but the pegging necessary to secure this object may be turned to account for the purpose of increase, as by this means alone, owing to the tendency of all the species to strike root from their trailing stems into the ground, if they are kept firmly attached to it, a larger increase may be obtained in one season from a plant than by means of cuttings or division. Cuttings, if they should be resorted to for increase, require the same treatment as has been already noticed for *Alyssum*, only the bell-glass is not so indispensable. They must be taken as soon as growth is active; and as they are of an unhandy style—always top-heavy—in the case of the species of the *albida* type, as much of the flexible cord-like stem should be taken along with the rosette of leaves as is convenient, in order to provide means of fastening the cutting securely in the soil. Seeds also may be used sown out of doors in any spare spot, but only the specific forms may be raised in this way with certainty; the variegated varieties do not come true.

A. albida, syns. **A. caucasica** and **A. crispata** (*Sicilian Rock-Cress*).—This is the best known, and one of the best, of the family. The plant forms diffuse patches of running stems, clothed at the extremities with rosettes of pale-green leaves, wavy and toothed on the margins, and clothed with greyish hairs. Flowers white, in profuse loose panicles about a foot high, appearing in greatest profusion from March till June, but flowering more or less earlier and later than those months. A most valuable plant for spring flower-gardening, for rockwork, for the mixed border, and for naturalising on dry banks, about ruins, and in open woods. The variety named *A. albida variegata* is a beautiful and useful plant for purposes of edging and

massing in the flower-garden. There are two distinct forms of this ; one with the variegation white, and the plant more weakly and small in all its parts—in the other, the variegation is yellowish or sulphur, and the plant more robust : both are useful, but the smaller-growing plant is the more elegant of the two. Native of Sicily, Greece, the Caucasus, and other parts of Russia.

A. alpina (*Alpine Rock-Cress*).—This form does not differ much from *A. albida*, except in respect of freeness of growth, in which it is inferior to that species, and in the smaller size and closer toothings of the leaves. The flowers are equally profuse and white, and appear from March till June, but it is less disposed to flower either before or after those periods. Enjoys a very wide distribution on the Alps, and affects a variety of habitats, but chiefly stony places.

A. blepharophylla (*Californian Rock-Cress*).—This species is of recent introduction. It is nearly allied to *A. albida*, having the same mode of growth and similar character of foliage ; the flowers, also, are of the *albida* type, and are of a rosy-purple colour. The flowers appear in May and June. Best adapted for culture on rockwork, but in dry warm soils will likely prove hardy in most parts of the country in the open border. Height about 9 inches. Native of California.

A. lucida (*Shining Rock-Cress*).—The species in this case is of much less ornamental value than the variety named *A. lucida variegata*, which is undoubtedly one of the handsomest of hardy yellow variegated plants at present in cultivation. The plant grows in close tufted habit, producing close rosettes of shining dark-green leaves beautifully margined with bright yellow. About 4 to 6 inches high. The flowers are white, but should not be allowed to appear in the variety, as the foliage becomes injured thereby. The normal form is a pretty plant on rockwork, being very neat and compact in growth. Native of Hungary.

A. procurrens (*Procurrent Rock-Cress*).—This is a pretty, smooth-growing, prostrate plant, with entire, shining, almost linear leaves, entire on the margins. Flower largish, pure white, rather profuse, appearing in April, May, and June. Height 6 to 9 inches. I have grown this plant for greenhouse decoration in shallow well-drained pots, and found it most useful in the end of February and throughout March for ornamenting front stages. A very pretty variety with variegated leaves is not very plentiful in gardens, but it is a beautiful plant, and should be more popular once it is more widely known than it is at present. Native of Carniola and Hungary. Easily pro-

pagated by cuttings in early summer, and by division in autumn or winter.

Aubrietia.—A very interesting and attractive genus, of few species so called, but which are not strikingly distinct in character one from the other. They are all, however, worthy of cultivation, though not together in one collection, except perhaps in the largest; but no collection of spring flowers may be considered complete without one or other of their best forms in its ranks. The same spreading trailing manner of growth, and the same rosette style or crowding of the leaves at the extremities of the stems and branches, as characterise the Rock-Cresses of the *albida* type, are characteristic of these little plants, but in miniature only, the plants being less vigorous and bold, and when managed well in a congenial situation and soil they become most beautiful objects. They are best adapted for culture on rockwork, their low carpet-like growth being invaluable for that kind of ornamentation. They succeed in all light loams freely in any situation; but very indifferently, and often fail entirely, in heavy wet soils. In beds and borders, in soils of the unfavourable kinds, they should be raised above the surface-level by some means, so as to secure that comparative dryness and freedom from stagnation they like so well. A very good plan, in heavy loam and clay, is to make a pit to the extent the plant is designed to occupy, and about half the depth of a spade, filling in with stones, brick-rubbish, or rough charcoal to the surface-level, finishing up with a mound of good loam and leaf-mould on the top of the drainage, about 6 inches deep, on which to plant. The better forms of these plants are worth any amount of trouble that may be necessary to secure their wellbeing; and those who succeed will not regret any tax that may have been temporarily laid upon them, when they come to enjoy the rich beauty they so freely and continuously yield at a period of the year when flowers in profusion are comparatively rare. Their brilliant dense masses of flowers are being turned to excellent account in spring bedding, or massing in flower-gardens. Propagation may be effected by cuttings in early summer in a shady place, by division in autumn or early winter, and by seeds sown as soon as ripe in a cold frame or under a hand-glass, the plants to be pricked carefully off into rich light soil as soon as they can be handled.

A. Campbellii (*Campbell's A.*)—This is comparatively a new form, and is probably of garden origin. It is the most brilliant of the group, forming dense carpet-like patches of pale-green foliage, which is profusely covered with comparatively large light violet-purple flowers from March till June.

A. deltoidea, syn. **Farsetia deltoidea**.—This is an old inhabitant of gardens, and though decidedly inferior in showy qualities to the preceding and other varieties, is no mean plant in its season. It is less luxuriant than *Campbell's A.*, and the flowers are smaller and pale purplish blue, but very abundant, appearing about the same time. The varieties *A. d. grandiflora* and *A. d. græca* are distinguished only by greater size and brilliancy of colouring, and are simply more valuable where these qualities are essential in the highest degree. They are all valuable plants for town gardens; for, except that their natural brightness does not appear to the greatest advantage in a smoky atmosphere and amid smutty surroundings, there are few alpine plants that can accommodate themselves with more facility to conditions so opposite to those of their native homes. *A. deltoidea* is a native of the Levant.

Barbarea.—In the natural state none of the species of this genus are fit for ornamental purposes, but there are two varieties of *B. vulgaris*—an indigenous species—which are worthy of cultivation in any garden.

B. vulgaris flore-pleno, syn. **Erysimum barbarea flore-pleno** (*Double-flowered Winter-Cress*, or *Yellow Rocket*).—This is a beautiful and curious plant. The process of doubling is very peculiar in the flowers; I am not aware of any parallel to it in other double flowers. There appears to be no attempt made at any time to form either stamens or pistils. But the axis of the flower has the power of extending itself and producing numerous whorls of petals as it grows in length, and assumes the appearance of a narrow cylindrical spike. A very lengthened succession of flower is kept up both by this peculiar extension of the axis, and by the natural process of development of the inflorescence, which is open, but rather rigidly paniced. Height about 18 inches. Flowers bright yellow, appearing from June till late summer, and often into autumn. *B. vulgaris* is a native of many parts of Britain, and this peculiar variety is probably an accidental production of nature or of cultivation. It is an excellent ornament of the mixed border, succeeds in almost any kind of soil, but prefers a rich moderately-light loam. Propagate by division of the root-stock.

B. vulgaris variegata (*Blotch-leaved Winter-Cress*).—This is the simple form of the species with yellow blotched leaves. The leaves are pinnate, the leaflets small on each side of the stalk, but the terminal one is generally very large, and in this variegated form is very conspicuous. The plant is interesting only as a variegated subject; the flowers are worthless, and

should be diligently cut away as soon as they appear, otherwise they injure the effect of the foliage. Propagate in the same way as the preceding. There are many finer plants in the same colour of variegation for massing and edging; but it makes a pleasing variety in the front lines of mixed borders of hardy perennials.

Cardamine (*Bitter-Cress*).—This is a large genus, yielding, however, very few species of much value for embellishment. They are plants of easy cultivation, succeeding very fairly in most soils and situations if not dry in the extreme, but are best adapted for moist or even marshy places. Propagate by seed in March or April in the open ground, or by division any time from autumn till spring.

C. pratensis flore-pleno (*Double-flowered Bitter-Cress*).—This is a very pretty pleasing plant, with little that is showy about it, but no little grace. The simple-flowered form is rather a common plant in moist places in Britain generally, but the double variety is not met with in nature, and not often even in cultivation. It is a pretty ornament of rockwork or moist borders. The leaves are pinnate, pale green; the flower-stems rise to the height of about 9 inches, bearing numerous flowers in open trusses. The flowers are pale pinkish purple, or white tinged with that colour, and are rather large, appearing in April and continuing far into summer.

C. trifolia (*Trifoliate-leaved Bitter-Cress*).—This is a pretty species with white flowers from Switzerland. It forms rather flat tufts of dark green, almost shining smooth trifoliate leaves, from the axils of which spring the simple leafless flower-stalks, supporting a somewhat dense truss of flowers, rather smaller in size than those of the preceding. They are very pure white, and appear in March and April. Height about 9 inches or 1 foot, suitable for culture in drier soils than the preceding sort.

Cheiranthus (*Wallflower*).—There is about an equal number of hardy and half-hardy species comprised in this genus. The latter must be passed over here with the remark, that most of them may be cultivated in the neighbourhood of London, and in the counties beyond it southward and westward, but generally not farther north, except in the mildest seasons. The best are *C. mutabilis* from Madeira, growing about 3 feet high, and producing a profusion of pale-yellow and purple flowers in April and May. *C. mutabilis* var. *longifolius*, commonly in catalogues named *C. longifolius*, has longer and narrower leaves, and pale pinkish-purple flowers faintly tinged with white, but in other respects is the same as the species. *C. semperflorens*, from Barbary, grows about 2 feet high, with white flowers,

which in the greenhouse appear at all times ; and out of doors, where favourably situated, as against a wall in a warm aspect, a very long and continuous succession of bloom is kept up. Among the hardy species, however, the most showy and useful are to be found. The common Wallflower may be taken as the type of the family as regards the form of the flowers ; but some of the dwarf species are superior to the best varieties of it in point of compact neatness of growth, while they are in no wise inferior as regards showy qualities and the duration of the blooming period. All Wallflowers delight in rich warm light soil, but they succeed very fairly in almost any soil. The varieties of common Wallflower are propagated by seed sown in the open ground from March till July, at several periods, for the purpose of keeping up a long succession. In mild seasons the plants from March sowings bloom throughout the winter, and later sowings succeed them in their order, carrying the display far through the summer. The double varieties of *C. Cheiri* are best propagated by cuttings, and so also are the other species. They are all rather short-lived perennials, both the tender and hardy species ; it is necessary, therefore, to anticipate debility by keeping always a few young plants in stock either from seed or cuttings. The cuttings may be struck out of doors in sandy soil under a hand or bell glass, in a place where they may be shaded from the mid-day sun, and they are most easily struck when the fresh growth is just beginning to harden at the base.

C. alpinus (*Alpine Wallflower*).—This species grows from 6 to 9 inches high, producing dense masses of bright yellow flowers from April till July. It is admirably adapted for the embellishment of rockwork, the front lines of hardy mixed borders, and for spring massing in the flower-garden. It succeeds very well in shady places, as among shrubs and on banks with a north aspect.

C. Cheiri (*Common Wallflower*).—This is too familiar a plant to require description. It has been a cherished garden-plant for centuries ; and on account of its showy flowers and rich perfume, it will no doubt ever remain a favourite with all lovers of sweet and beautiful flowers. There are a good many varieties, both single and double, which may be procured in separate colours or in mixture ; but certain of the double varieties can only be kept up true to kind by means of cuttings. The double yellow, double variegated, or yellow and red, the *C. C.* var. *patulus* or double-spreading, and the double blood-flowered or *C. C. hœmanthus*, are all sorts that, if valued, must be kept in stock by cuttings, as they rarely seed ; and even if they do,

it cannot always be depended on that the progeny will be the same as the parent. The value of Wallflower for embellishment can scarcely be too highly rated; and as it is very generally appreciated, there is no great need for insisting on it; but there is a purpose for which it is admirably adapted that cannot be too strongly urged, especially as it is only very rarely seen used for it, and that is the decoration of ruins or old walls and rocky banks, where little else having much claim to be considered bright and beautiful will live, far less embellish. The single varieties may be established in such places at very trifling cost and trouble. The merest film of soil, if hard and firm, will support the plants for years. They may be sown where it is desired they should be established; and when they do take hold, they will sow themselves and spread in all directions.

C. Marshallii (*Marshall's Wallflower*).—This is one of the handsomest, if not the most handsome and showy, of the group. It is said to be of hybrid origin, the alleged parents being *C. alpinus* and *C. Cheiri*; but it inherits the characteristics of the former only to any degree, and no one would suspect that it was a blood relation of the latter by a comparison of their respective features. It is rather more robust in habit than *C. alpinus*, and the trusses of flower are somewhat larger, but it is a most compact plant, growing from 9 inches to 1 foot high, and producing an immense profusion of bright orange-coloured delicately-scented blossoms. It is a brilliant ornament of rockwork and the mixed perennial border, and a choice subject for massing or edging use in spring bedding-out; few plants indeed, so hardy and easy to cultivate, equal it in showy beauty and continuance of massy display. Every amateur and cottager should grow a plant or two of it. Flowers from April till July.

C. ochroleucus (*Straw-coloured Wallflower*).—This species resembles the last in habit and stature, and form of leaves, but the flowers are lemon or straw coloured. It is a profuse-blooming plant, producing its flowers in April, May, June, and July. Height from 9 to 12 inches. Native of Switzerland.

Diptolaxis tenuifolia—syns. **Brassica tenuifolia** and **Sisymbrium tenuifolium**—is a member of an uninteresting genus, and though flowering the summer throughout, would not be tolerated in flower-gardens in its normal state of weediness; but a variety with variegated leaves is well worth cultivating where variegated plants are in request, as it is tolerably handsome if well managed. The leaves form considerable tufts about 9 inches high, and are 5 or 6 inches long, pinnate or pinnatifid, but often also simple or undivided except by a few irregular shallow notches per-

fectly smooth, and margined with creamy yellow. It is not one of the most elegant of hardy variegated plants, but is very distinct, and has the additional merit of being adapted to grow in dry sandy soils where many of the more choice variegated kinds would not exist; indeed it should be planted in poor soil in order to insure the best development of its peculiarities, being apt to run green in rich soil. Native of Britain. The flower-stems should be diligently removed as soon as they appear.

Draba (*Whitlow-Grass*).—A rather numerous genus, comprising both annual and perennial plants, but mostly perennial. They are diminutive alpine plants inhabiting the most elevated positions in the lofty mountain-ranges of both hemispheres and the arctic regions. They are best adapted, therefore, for culture on rockwork, on which they are very pretty ornaments, though, like most of the inhabitants of those wild and frigid homes, they are difficult to keep under the more genial influences of our climate. They are propagated by seeds sown as soon as ripe in a cold frame, or under a hand-glass in small pots—or the seed may be kept over winter, and sown in March in the same way; and in each case they should be pricked off into gritty loam, two or three together in a small pot, well drained, keeping close and shading for a few days till the plants begin to grow. They may also be increased by cuttings in spring, after some growth has been formed, in sandy loam under a glass out of doors in a shady place; and by division in spring as growth commences, or in autumn after growth is quite matured. Gritty moderately-rich loam is the most congenial soil to these plants, and they prefer a rather sunny position.

D. aizoides (*Aizoon-like D.*)—This is a dwarf-tufted species growing about 3 or 4 inches high, producing its narrow rigid leaves in densely-packed, somewhat pyramidal, rosettes. The flowers are bright yellow, in small compact trusses, and appear in March, April, and May. Native of the mountains of central and southern Europe; found also indigenous in Wales, but suspected of having strayed from cultivation to the natural positions it inhabits near Swansea.

D. Aizoon (*Aizoon D.*)—This species is nearly related to the last, but distinct. The habit of growth and foliage are similar, but the flowers are smaller, in larger clusters, and are pale yellow or sulphur; they appear at the same time. Height 3 to 4 inches. Native of Carinthia.

D. ciliaris.—This species is very distinct in foliage and flowers from either of the preceding. It grows about the same height, but the foliage is less rigid both as regards texture and

arrangement. The flowers appear in March, April, and May, are pure white, large individually as compared with those of the preceding, in loose clusters. Native of Switzerland.

Hesperis (*Dame's Violet or Rocket*).—This is not a numerous genus in perennial species, but is of great value, on account of a few varieties of the common Rocket *H. matronalis*, the great beauty of which is much enhanced by the delicious fragrance they possess. The single varieties of Rockets are tolerable as components of the mixed border only in large collections of perennials: their proper use and value, however, is in the ornamentation of open woods, banks about streams and lakes, semi-wild places either in partial shade or sunshine, and shrubberies. Their ornamental qualities are not of the highest character, but their fragrance is welcome everywhere. The double varieties are much more ornamental, and they produce a more permanent floral effect, while their fragrance is not inferior to that of the single ones. They are fit to grace the most select position, and they are especially commendable to amateurs, whose gardens, being limited, should contain only the cream of gay plants and sweet. One drawback to their being universally cultivated must be noticed. They are very short-lived in many soils, especially those of a light sandy texture. It is often experienced that, while the single varieties grow and flower well in such soils in a state of nature—that is, with the surrounding surface clothed with herbage—the double sorts become quickly unhealthy, and will not be coaxed to live for any length of time under the conditions of cultivation or artificial keeping. In and about large towns, except the soil is very congenial, they rarely succeed well, as they have a special repugnance to the smoky impure atmosphere of towns and their environs. The soil in which they attain their greatest luxuriance and beauty is a rich deep loam, well drained, on a cool bottom. But under the most liberal treatment, and in the most suitable soil, they are apt in a few years to decline in vigour and ultimately die out. The species is, in fact, but a rather long-lived biennial, and it is consequently necessary to propagate periodically by cuttings in order to keep up a healthy vigorous stock of flowering plants. Cuttings may be taken at various periods and in different conditions: when they have made a little growth in spring; when, after early flowering, the stems have been cut down and second growth made; and just when the flowers are on the wane the stems may be cut over and used as cuttings. To take cuttings at the first period entails of course a greater or less loss of flower; but it sometimes happens that the choice lies between that temporarily and the total loss of stock; and if the

plants on starting show any symptoms of sickness or weakness, there should be no hesitation in choosing the lesser evil, for the chances are that the plants will not survive the flowering period, and the flower-stems in such cases are rarely of any use for the purpose of propagation. Cuttings taken in the early part of the season should be chosen of rather weakly or medium strength, those that are gross and succulent being very apt to damp off; and it is advantageous to secure a small bit of the old crown at the base of the cutting. They should not be more than 3 inches long when taken off, and should be planted in very sandy soil in pots under a hand-glass out of doors or in a cold frame; but if a spent hotbed in which a little bottom-heat remains can be used, so much the better, as it will insure greater success. Those cuttings made of the flower-stems, if the plant is vigorous, are often very successful; but they must be taken immediately the first indications of the waning of the flowers are observed, as they soon become hard and lifeless, and will not emit roots. They should be cut into lengths of three or four joints, and cut clean over immediately under the lowest joint; and if very hard, the bark should be slightly scarified with the knife to the extent of 1 inch above the base of the cutting, to facilitate the callousing process, otherwise they should be treated exactly like the earlier cuttings. The later cuttings—those procured by the autumn or late summer growth that is made after flowering—are generally the most convenient, as the floral display is not in any way diminished by them; but the system of annual propagation must be assiduously attended to in order to be able to procure the cuttings, and it is generally advantageous to stimulate the plants immediately after flowering, by pricking into the surface with a fork a little fresh loam, and light well-decomposed manure, and by copious watering if necessary. The cuttings, taken as soon as they can be got, should receive the same treatment as the spring cuttings, and they may be wintered in any sheltered warm place out of doors; but, if convenient, they are better kept in a cold pit, frame, or under a hand or bell glass, where they may be protected from battering rain and severe frost. A very cool treatment must be given them, however, under protection; air to be given in all weather except severe frost, by tilting the protection in wet or snowy weather, and removing it wholly when these do not prevail. They are also propagated by division, both the double and single varieties; but the method, though less troublesome than that of cuttings, is not so satisfactory and sure. The best time to divide is immediately after flowering is done; and if possible a showery period should be chosen in which to perform it,

otherwise close attention to watering will be necessary, and it should not be given in daily dribblets, but in abundance when obviously required. The single sorts are best raised from seed sown in the open ground in March or April, the plants afterwards to be pricked out into their permanent positions. They may also be increased by division if only limited increase is required, but seed is preferable for the purpose of raising large quantities for planting out in bulk. The characteristic features of the Rockets, whether single or double, are too well known to require description. The best double varieties are the double purple *Purpureo-pleno*, the double white *Albo-pleno*, the double red *Rubro-pleno*, and the double variegated with purple and white blotched and striped flowers, named *Variegato-pleno*. There are better and worse strains of these—some loose and inclined to lankiness, and inferior in brightness of colouring, and others more compact, more double, and bright; but soil and culture exercise an important influence on these points, and aged plants generally deteriorate much, hence the necessity of keeping the stock always vigorous by assiduous periodical propagation. There are representatives of the above colours in single sorts also; they grow about 3 or 4 feet high: the double sorts are more dwarf and compact, rarely exceeding 2½ feet. The species is a native of Italy, and begins to flower about the end of May, and continues throughout the two or three following months. There are other sorts sometimes named specifically in our catalogues which are only varieties of *H. matronalis*: the most frequent of these is *H. inodora*, an almost scentless form of the species; and *H. siberica*, with pink flowers. Other species there are, but rare if at all to be found in our gardens nowadays, and which are not equal in any respect to the varieties of *H. matronalis* noticed above.

Hutchinsia.—A genus of very few species, only one of which is at present known in gardens in this country, and not so well known as it should be. *H. alpina* is a very dwarf compact-growing perennial, producing deeply-pinnatifid leaves and pure white flowers in clusters, supported on stems about 2 or 3 inches high, and in considerable abundance. The flowers appear in May and June, and occasionally also in July. Although a tiny plant, it delights in a soil of considerable depth, as in deep fissures of rockwork. It is best adapted to the adornment of rockwork, and should have an open sunny position, but succeeds well also in the open border if the soil is not close and retentive. It would no doubt be useful also for edging and massing in the spring flower-garden if kept in pots in reserve for that purpose. Propagate by division after flowering is well over,

or in the autumn early, or in early spring, and by seed sown in small pots in a cold frame or where it is to remain, if a few plants in a permanent position on rockwork or open border are all that is aimed at. It is widely distributed on the greater mountains of central and southern Europe.

Iberidella rotundifolia, syns. **Thlaspi rotundifolia** and **Iberis rotundifolia** (*Round-leaved I.*)—This is a little-known plant in British gardens, but deserves a place in every collection of alpine plants. It is a dwarf compact plant, with thick, leathery, slightly milky-green, roundish leaves, rather densely tufted. The flower-stems rise to the height of 5 or 6 inches bearing the flowers—which are rosy lilac with a yellow centre, and sweet-scented—in erect dense racemes. The plant is most suitable for rockwork, and succeeds best in rich gritty loam in deep fissures; being tap-rooted, it will not readily increase by division, but it is easily raised by seed sown in small pots in a cold frame, or in the spot it is designed to occupy. It is an elegant bright little plant, which should be in every collection. Flowers from May till July, and is a native of the Swiss Alps and other European alpine regions.

Iberis (*Candytuft*).—This is a beautiful and well-known group of hardy plants. It comprises a good many species, but among the perennials there are but a few really distinct for ornamental purposes, the others being too close in resemblance to be worthy of being cultivated, except in botanical collections. They are plants of most simple requirements in cultivation, adapted to grow in any kind of garden-soil, succeeding best in that which is light, rich, and dry, but doing very well in the debris of an old ruin, or on a dry sandy bank where not many plants would exist. If this easy habit were taken advantage of freely, many an unclothed and uninviting spot would be gracefully garnished and attractive throughout the year. Besides their great value as mixed border-plants, and for the adornment of rockwork, they are invaluable subjects for the spring flower-garden, whether as temporary occupants or permanent in a garden set apart for such plants; they are useful also for planting in shrubbery borders. Propagate by seed sown in the open ground, or better in a cold frame or hand-glass, and by cuttings or division, at almost any time of the growing period; but both operations are best performed either immediately after flowering is over or in early autumn.

I. corifolia, syn. **I. saxatilis**, var. **corifolia** (*Coris-leaved Candytuft*).—If not one of the best of the group, this is one of the dwarfest and neatest, rarely exceeding 6 inches in height, making a close carpet of bright green foliage, and producing its

flowers in small rounded heads in great profusion in April, May, and June. Best adapted for clothing rockwork, edging, small beds, or for the front lines in mixed borders. Native of Sicily.

I. Garrexiana (*Garrex's Candytuft*).—This is one of the least valuable of perennial Candytufts, but one of the most commonly cultivated. It comes very near the Evergreen Candytuft, and is regarded as a variety of it; but the heads of flower are smaller, and from the tendency to elongate that the racemes have after flowering, it assumes rather a seedy aspect at the end of the flowering season. But it is nevertheless a valuable sort, being very tenacious of place once it gets a hold, and a free grower, and consequently more useful for naturalising on dry rocky places where some of the more choice sorts would not so easily establish themselves. It grows in close carpet-like masses about 6 to 9 inches high, flowers in April, May, and June, and is a native of Piedmont and Spain, and probably of other parts of Europe.

I. gibraltarica (*Gibraltar Candytuft*).—This is one of the most ornamental of the group. It grows from 9 inches to 1 foot high, in close tufted manner, with leaves, flowers, and flower-heads considerably larger than those of any other Candytuft known to cultivation. The leaves are large, dark green, oblong, and increasing in breadth towards the point; and the flower-heads are close and broad, and have no great tendency to grow out into seedy racemes. This is a very rare plant in cultivation yet, and has not been sufficiently tried throughout the country to prove its adaptability to our climate at all seasons. It will be found best suited for culture on warm sheltered rockwork in sunny positions. Flowers white, shading off in age to pinkish lilac, and appearing in May and June. Native of the south of Spain.

I. Pruiti (*Pruit's Candytuft*).—This being undoubtedly hardy and little inferior to *I. gibraltarica* in point of size of flowers, and being also pure white, is one of the brightest and best of the genus. It grows about 9 inches high, producing dense masses of dark-green foliage, rather large in size, and oblong in shape. The flowers are large in compact heads, not elongating much in flowering, and appearing in May and June. Native of Naples and other southern countries of Europe.

I. sempervirens (*Evergreen Candytuft*).—This species is widely distributed and well known in gardens in this country. It grows in compact, carpet-like, pale-green masses, producing a great abundance of pure white flowers in small heads, which have the objectionable feature of elongating during the process of and after flowering. One of the most useful, succeeding well

in any soil and in most situations, but preferring bright sunny ones and light dry soil. It is admirable clothing for dry rocky places and sandy knolls, and luxuriates most in such places, but succeeds also well in open borders; and being very hardy, it should be planted more freely even than it is. Native of many countries of southern Europe and Asia Minor.

I. Tenoreana (*Tenore's Candytuft*).—From the colour of the flowers differing considerably from the other kinds, this species should become more favoured when it becomes better known and more plentiful. It resembles *I. gibraltarica* in its style of growth and the form of the flower-heads, which are close and compact and do not elongate, and the colour, white at first, changes to purplish red. It differs from *I. gibraltarica* also in being hairy in nearly every part. The blossoms are very profuse, but the plant in the true form has not been proved as regards hardiness north of the Tweed, in so far as I am aware, and should therefore be trusted out with caution in the north in winter till such time as there is ample stock in hand to cover any casualty. Native of Naples.

CISTACEÆ.

The only genus in this order that may with propriety be associated with herbaceous plants is *Helianthemum*, the Rock-Rose. The species comprised in this genus—a large one—are, with the exception of one or two, more or less woody, being dwarf diffuse shrubs, well adapted to the purposes to which dwarf herbaceous and alpine plants are turned in ornamental gardening. It would be difficult to overpraise the beauty of the flowers of these Rock-Roses, so brilliant in colour and handsome in form are they; and it is astonishing that so few of a family so ornamental should be cultivated in our gardens. Possibly the fugaceous character of the flowers may explain why they are so seldom seen; but the long-continued succession of flowers that may be kept up on well-cultivated young plants should be ample compensation for any defect of that kind in the individual flowers. The blooming season is often brief enough on old weak plants, but on young vigorous ones a close and profuse succession is kept up for a month or two. They offer a most promising field for the labour of the florist, not only in the way of selection, but also in hybridising. The florist has had less encouragement to undertake some of the

subjects that have so richly rewarded his efforts with brilliant results. It is quite possible that in a few years, by well-directed selection alone, much might be done for the improvement of this much-neglected but beautiful family. There is already, perhaps, all that could be wished as regards colour; but it would be a fortunate achievement to produce brilliant varieties with the invaluable quality of a long and continuous blooming season. In all the host of gay things included in the general category of bedding plants, none are more bright and beautiful than these in their season; may some one with the requisite skill and means take the Rock-Roses in hand then, and improve and extend their fine qualities. Many will be found to succeed well in the mixed border, if the soil is not tenacious and damp, and the exposure is bright and sunny; but the majority are better adapted for culture on rockwork and in dry banks and rocky and sandy places, while a few will require protection from the rigour of our winters in a cold frame, either by lifting the old plants or taking cuttings and storing them after the fashion of half-hardy bedding plants—that is, without artificial heat, but duly protected. They are most easy to cultivate, and the larger number, when they become established in a place, keep it well and tenaciously; but it is well to be prepared with a few plants from cuttings annually in order to make gaps good; and, as above stated, young plants, if healthy, are the most prolonged and continuous bloomers—a point in their successful culture that should always be kept in mind. As to soil they are not fastidious, if only they are not attempted in clays or very wet soil, neither of which is congenial to them; but they are seen perhaps to the greatest perfection in a mixture of peat and loam, or any very light dry loam. They are easily propagated by cuttings just when the shoots of the current season's growth are beginning to become a little hard and matured, and they may be managed successfully by putting them under a bell-glass out of doors, or into a cold frame either in pots or without, keeping them close and shaded from scorching sun for some time after putting them in. The list of species is a very long one, too long for all to be noticed here, even were it desirable to do so; but there is much confusion as to the limits of specific forms, and much sameness of form and colour; and when they are regarded simply as subjects for decorative purposes, a selection embracing some of the most distinct and beautiful ought to be aimed at, and the following are a few of the best.

H. algarvense, *syns.* **H. ocymoides** and **Cistus algarvensis** (*Algarve Rock-Rose*).—This is a tall-growing species, most suitable for planting along with the larger-growing herbaceous

plants and the more bulky of alpine plants and dwarf shrubs, and about the margins of masses of shrubs as well as on rock-work. It reaches a height of about 2 feet, rather diffuse in habit. The stems and branches are clothed with ovate-lanceolate stalkless leaves, and hairy, as are all the parts outside the corolla. The flowers are large, bright yellow, with a purple blotch at the base of each petal. They appear in June and continue till August. Native of Spain and Portugal.

H. croceum (*Saffron-coloured Rock-Rose*).—A dwarf, diffuse, somewhat trailing species, yet compact and close in growth, growing from 6 to 9 inches high, producing ovate-lanceolate leaves, hoary and downy beneath, milky green above, and with the margins recurved somewhat. Flowers in terminal drooping racemes or clusters, dark saffron-yellow, appearing in June, July, and August. Native of Spain.

H. formosum, syn. **Cistus formosus** (*Beautiful Rock-Rose*).—Very near *algarvense* in character, differing chiefly in the excessively downy character of the branches and shortly-stalked leaves, which are also more acutely pointed. The flowers are large, bright yellow, each petal having a blackish spot at the base. Height about the same as *algarvense*, and the plant is adapted to the same purposes as that species; but it must be repeated that neither of these, nor indeed any Rock-Rose, will give much satisfaction in wet soil or in shady places, but delight in dry, sunny, exposed positions. Native of Portugal.

H. grandiflorum (*Great-flowered Yellow Rock-Rose*).—Rather closely related to *croceum*, but of larger growth, and producing oblong hairy leaves without recurved margins, and large, handsome, bright yellow flowers, appearing in June and July. Native of Italy. Adapted for either select rockwork or the front lines of mixed borders.

H. macranthum (*Large-flowered Rock-Rose*).—This is a handsome species, rather trailing in habit, but rising to the height of 9 to 12 inches, producing numerous branches clothed with oblong-oval sharp-pointed leaves, and both leaves and branches densely covered with ashy-grey down. The flowers are creamy white, large, and numerous, in terminal racemes. Native of the south of Europe. Best adapted for sunny positions on rockwork.

H. polifolium (*Polium-leaved Rock-Rose*).—This is a small, compact-growing British species, with white flowers; not one of the most showy, yet its clear white flowers and compact habit render it worthy of a place in larger collections. The whole plant is hoary; the leaves are narrow, oblong, and much recurved on the edges, and the height about 6 inches: flowers

appearing in May last till June. Best adapted to adorn rock-work, and will not exist on wet flat positions.

H. Tuberaria (*Plantain-leaved Rock-Rose*).—This species belongs to a very distinct but small section of the family characterised by herbaceous instead of ligneous or shrubby stems and branches. It grows about 1 foot high, producing three-nerved plantain-like leaves, very hairy and large as compared with those of the shrubby kinds. The flowers are large, bright yellow, with a dark purplish-red zone in the centre: they open in June and last till August. Native of the south of Europe. Most suitable for rockwork and mixed borders in well-drained rich loam.

H. vulgare (*Common Rock-Rose*).—This is another British species, and one of the most widely distributed of Rock-Roses on the continent of Europe, as well as one of the best known at home, for it is to be found in many British gardens in one or more of its numerous varieties. It is one of the most gay and variable, as well as the most easy to cultivate; for though it refuses to grow in continuously damp places, it is not so fastidious as regards frequent drenchings as many Rock-Roses are, if the position is only sunny and airy. The general character of the plant is low diffuse growth, with numerous stems and branches clothed with oblong or lanceolate leaves, hoary beneath, bright green above, and hairy, with the edges generally flat, not recurved, and yellow flowers in a loose terminal raceme; but there are many varieties about gardens differing more or less from the type, although the greatest variation takes place in the colour and size of the flowers. The variation in colour is considerable, there being many shades between straw and deep red, which are the two extremes; and there are several varieties with combinations of different shades, and one or two doubles in well-marked colours. But the most remarkable variety is that named *H. vulgare* var. *surrejanum*, which has the petals much reduced in breadth and deeply cut. It was originally discovered near Croydon, and has been regarded as a good specific form; but, except as a curiosity, it is scarcely worthy of cultivation.

VIOLACEÆ.

If this natural order presented nothing except the Sweet-Violet for our admiration, it would have a very strong claim on the consideration of all lovers of sweet and beautiful flowers.

But there are many other species of Violets which add, by their beauty or fragrance, or both combined, to the floricultural value of the order; and those with a turn for deeper sifting than colour and odour will find in the structural peculiarities that characterise the group and determine its affinities much to interest and admire. *Viola* itself forms the greater bulk of the order, and I am not aware that any of the other genera furnish worthier hardy herbaceous subjects. *Erpetion* is sometimes included in lists of hardy plants, but it is not hardy in the broader sense, although in a few favoured localities in the south and west of England it has survived mild winters; and *Solea*, another offset of *Viola*, though undoubtedly hardy, is of no ornamental value. *Erpetion* may be noticed here because of its great beauty and its usefulness for out-of-doors work in the summer, in any part of the country. *Violas* are all plants of the easiest requirements as regards culture. They thrive best in a good rich gritty loam, but do very well in various kinds of soils. A very important point in the culture of these plants is an abundant supply of moisture during the growing season. They are much better adapted for growing in naturally damp soils than in dry ones; and if a choice can be made this should be remembered, otherwise ample artificial supplies must be provided. More particular remarks regarding culture will be made, when necessary, under the species, and all that need be noted here in a general way is, that *Violas* may all be increased by means of division and cuttings; and in all cases, where practicable, the latter is the best, because productive of the most vigorous plants; and it is so simple an operation, and requires so few ordinary facilities, that it may be practised everywhere. Cuttings may be taken any time early or late in the summer as they can be got, inserted in sandy soil under a hand-glass in a shady place, and kept close for some time, or until they begin making roots, when a little air may be given by degrees, increasing daily. They are all easily raised from seeds also, and by this means varieties of interest and value are obtained, especially of the more variable species, such as the Pansy. The seeds may be sown in spring in pots in a cold frame, or in a bed or border in a warm spot of the garden, afterwards nursing them on by pricking the seedlings out from the seed-bed into rich soil in a somewhat shady but warm position, where they must be abundantly supplied with moisture.

Erpetion reniforme (*New Holland Violet*).—This beautiful little plant is too tender to be trusted out in our climate in most parts of the country during winter; but it is such an

essential gem that it should be included in every collection of any pretensions, where a dry cold frame can be afforded it when it wants protection. I have seen it survive mild winters in the neighbourhood of London; but it was late in being stirred into growth, and weakly throughout the season, and flowered unsatisfactorily. There is no doubt but that it would be much more comfortable and successful left out in some of the more southern and western parts of England, and the more favoured localities of Ireland; but there is little hope for its safety if left out in Scotland. It has quite the habit and appearance of some of the smaller alpine Violets, extends itself by weak trailing branches rooting as they advance, has small bright-green kidney-shaped leaves, and the flower-stalks only 2 or 3 inches high, bearing the small delicate blue-and-white flowers in moderate profusion and long continuance. It is a charming little pot-plant cultivated in the same way as pot alpine plants, and may be used with good effect in light airy greenhouses; but its best use will be found in edging and carpeting small beds in warm positions in the flower-garden. In the north it may not succeed so well in this way as in the south, but in warm terrace-gardens it may succeed in any part of the country; and it is so easily propagated by division and cuttings that it should be tried out of doors everywhere; for though not very striking, it is sure to arrest the attention of all who may pass it who are fond of simple beauty and freshness. In cold localities the plants would be best plunged in their pots instead of planted out. Native of Australia.

Viola calcarata (*Spurred Violet*).—This is a low-growing species with many underground creeping stems, by which it extends itself and forms carpet-like masses of a lively green. The stems are angular, and clothed with acutely-egg-shaped leaves toothed on the margin. The flowers, produced in great profusion, are large, pale purple, and furnished with a conspicuous awl-shaped spur. Adapted to either the rockwork or mixed border, preferring a little shade and ample supplies of moisture during the growing season. The yellow-flowered *V. Zoysii* of some catalogues is regarded by some botanists as a variety of *calcarata* under the name *V. c. flava*. Flowers from early spring throughout the summer in moist situations. Native of the Alps of Switzerland.

V. cornuta (*Horned Violet*).—This is very near in character to the last, but is a more vigorous plant, and further distinguished by its broader and less deeply toothed leaves, and the more upright tendency of the stems. It is now a well-known plant in flower-gardens, having been extensively tried for some

years as a dwarf bedding plant, and most conflicting reports have been made regarding it. When it is successful, there can be but one opinion as to its merits. It is very beautiful, but it is successful as a massing or edging plant only in moist soil and seasons. There are several varieties of greater or less pretensions for being improvements on the normal form, but chiefly marked by different shades of the purplish colour of the original. The best that has appeared is the one named "Perfection," a very distinct and handsome plant with large Pansy-like flowers of a bright purplish-blue, yellow-eyed, and more strongly fragrant than the reputed parent; but it has so little in common with *cornuta* beyond the *horn*, that there are grounds for questioning the alleged parentage. It is as unlike *cornuta* in its power of resistance of drought as in most other particulars. During this excessively droughty season (1870) it has looked fresh and bloomed profusely, while *cornuta* has been "done brown" for weeks. *Cornuta* is a native of the Pyrenees.

V. lutea (*Yellow Mountain-Violet*).—This is another unsuccessful candidate for parterre honours of recent introduction. It is a native of mountain-pastures in Wales and the north of England and west of Scotland. It grows in rather a straggling manner, rising 3 or 4 inches high, with weak stems and small oblong egg-shaped leaves. The flowers are bright yellow, with a few black lines radiating from the centre on the lower petals. Although it succeeds better in the majority of dry soils and aspects than *V. cornuta*, yet it is not so floriferous as that species, and has disappointed many in the expectations raised regarding its adaptability to summer bedding-out when first introduced for that purpose. It is a pretty little gem, creeping over rockwork, or in the front line of a partially-shaded moist mixed border; but in bright blazing parterres it is eclipsed, and very often burnt up, and does not supply effectively the much-desiderated dwarf bright yellow edging plant. The variety *grandiflora* has, as its name implies, larger flowers than the ordinary form, and is somewhat of an improvement also in the matter of habit, being slightly more vigorous. Flowers continuously from May till September.

V. odorata (*Sweet-Violet*).—It would be superfluous to describe this universally known and cherished plant. In one or more of its varieties it is to be seen in every garden, large or small; all love it—and well they may—for its modest beauty and sweetness are unrivalled. The immense demand for it about the large cities, such as London, Manchester, and Liverpool, throughout the spring, has rendered its culture a profit-

able branch of market-gardening, and acres of Violets are to be met with in the neighbourhood of such places : and the gardener in private establishments must have a long season of Violets by whatever means, or he fails to please the ladies by a good many points ; for Violets, in season and out of season, are indispensable in many establishments. The Sweet-Violet is a British plant, common in many parts in hedgerows, open woods, and pastures, and very generally affecting clayey districts ; while in many widespread parts, where the soil is gravelly, or hot and dry, it is rarely if ever seen. The plant, in fact, prefers moderate shade and considerable moisture, and strong rich loam to grow in ; and the nearer we can attain to these conditions in cultivation, the greater will be our success.

Many have written on the culture of the Violet, and the writers have by no means been harmonious in the practice they inculcated, though each has stoutly enough maintained that his, and his only, was correct and likely to be attended with success—as indeed it may really have been in his circumstances, but not therefore the best for one differently situated as regards climate, soil, and choice of aspect. A moderately heavy rich soil is that in which they thrive best, and sustain the most continuous and abundant bloom ; and if the natural soil is in any point short of this, the best means at command should be adopted to bring it up to the desired condition. If it is light and gravelly, clay and manure should be added to it, in requisite quantity ; or if a poor hard clay, sharp gritty matter, with no stint of old manure, would be the proper correctives. As regards the aspect of the spot on which they are to be grown, it is a point of some importance, especially if no natural means of affording the plants a little shade are available. Whether it is open to the east, the west, or the south, is of less importance than the necessity of placing them where they will enjoy slight shade either in the morning or afternoon. My own experience is most favourable to placing them on a west border, where they will be sheltered from the rays of the sun during the earlier hours of the day. It is well, however, to have the stock designed to bloom out of doors growing in different aspects, as by that means there will be less danger, in exceptional seasons, of total failure. A very important point in their culture, by the practice of which I have always been rewarded with good results, is to lift and divide the plants annually, cutting away all old and weak crowns and runners, and trimming the roots, trenching and manuring the ground, and replanting them. The best time for doing this is immediately after the flowers are over, about the middle or end of April or the beginning of

May. It is bad practice to leave them undisturbed for several years in the same place ; the ground becomes exhausted, and the plants too ; and it is always difficult, often impossible, to get a vigorous stock from plants so treated. The Neapolitan, a more tender variety of the Sweet-Violet, is best adapted for culture in pots, to be sheltered in cold frames, in a sunny airy place in winter, or forced according to requirements. These may be grown planted out in rich ground in the same way as the others till September, when they may be lifted and potted or planted in frames closely, and afterwards merely protected from severe frost, and kept well aired in all open weather. Of course, if they are intended to be placed about rooms, they must be put in pots at the time they are removed from the open air, and they may be forced in mild bottom-heat with much more convenience if the plants are in pots than if they are planted out in frames. All the varieties are easily increased by cuttings made of the stout short runners, rejecting all that are wiry and hard ; and they should not be taken off plants that have been forced, as these are deficient in vigour. Plant them in rich, fibrous, very sandy soil, in a frame facing northwards ; keep them close till they begin to grow, then give air, a little at first, gradually increasing it till the lights may be dispensed with wholly till the return of winter, when they will require to be put on, and the plants protected during frost. In the beginning of April they must be planted out, and everything possible done to encourage vigorous growth, on which depend the quality and quantity of bloom more than anything else. Some raise their stock from seeds sown annually ; and it is a good plan, but more troublesome in the matter of attention, and requiring more labour, than either division or cuttings, while the result in bloom is nothing superior. Among the varieties of Sweet-Violets, the Czar, the King, and Giant are the largest flowers and stoutest stalks, and are consequently best for cutting ; but I have not found either superior to the common Russia, in single or double flowers, for continuous and sustained bloom, while nothing surpasses the Neapolitan for forcing.

V. palmata (*Palmate-leaved Violet*).—This is a very rare plant in gardens, and a very distinct species. It grows about 6 inches high, in rather tufted fashion, with palmated or five-lobed coarsely-toothed hairy leaves, and rather large purple flowers on stout short stalks. Native of North America. Best adapted for culture on rockwork, in deep rich gritty loam, in shade. Flowers in late spring and early summer.

V. pedata (*Birdfoot Violet*).—This is related to the last, but

is even a finer species, and about as rare. It grows about the same height, and is very compact and neat in its style. The leaves are cut into seven narrow lobes, the basal and the central ones usually deeply notched. The flowers are large, dark blue, carried well above the leaves on stout stalks. Best adapted for rockwork decoration in deep moist sandy soil, in shade. Native of North America. Flowers in late spring and early summer.

V. pennata (*Feather-leaved Violet*).—This is a south European species, with much of the habit of the two preceding. The leaves are broadly ovate in outline, and divided almost to the midrib, giving the appearance of a broadly-pinnate leaf, and the divisions are notched at the point. The flowers are smaller than in either of the two preceding, nor are they thrown so high above the foliage, but they are rich dark violet, and in this respect they are superior to those of the others. It requires the same treatment in cultivation, and is adapted to the same purposes as *palmata* and *pedata*, and flowers about the same time.

V. pyrolæfolia, syn. **Viola lutea** (*Winter green-leaved Violet*).—This is a Patagonian species, and one of the handsomest of the family. It grows in tufted masses, producing bluntly-egg-shaped leaves with a heart-shaped base, toothed and hispid, as is every part of the plant outside the corolla, and inside also it is somewhat bearded. The flowers are large, bright yellow, on slender stalks, but raised considerably above the foliage; the lower petal is beautifully pencilled with narrow dark-red lines. Suitable only for warm partially-shaded positions on rockwork or for pot-culture, and delights most in rich fibrous loam with a good allowance of grit in it.

V. tricolor (*Pansy* or *Heart's-ease*).—The garden varieties of the Pansy are so familiar, and so much admired by everybody, that they scarce require praise or description; the mere mention of their name is sufficient recommendation. It is less of the finer florists' varieties or show sorts that I would speak, than of the Fancy or Belgian and bedding ones. They will be found most useful for planting in the front line of the mixed border and on rockwork. The Fancies bloom very freely and for a long period if the soil is moist and rich; and they present most novel and pretty colours and unions of colours. But for continuity of bloom and general decorative usefulness and hardiness all kinds of Pansies are eclipsed by the bedding sorts. The Cliveden blue and yellow were the first of the race to which general attention was drawn, but they are now rapidly increasing in numbers and in improvement, and no doubt will

continue to do so for some time. The Pansy delights in strong rich loam with a little sand in it, and is most sustained in its bloom when shaded for some part of the day, and copious moisture can hardly be overdone in the growing season. *V. tricolor* is a native of Britain, and it is the reputed parent of all the races of Heart's-ease. Other European species, there are good grounds for believing, have had something to do with the origin of these favourite flowers; but in the mixed and confused condition of the cultivated varieties now, it is impossible to determine with any accuracy their parentage, but the probability is that *tricolor* and *altaica* give rise to the Pansies between them.

The few species described above do not nearly exhaust the list of plants valuable for ornamental purposes comprised in the group. They are only a few of the best, and the following list contains others well worthy of cultivation in larger collections: *V. alpina*, 4 to 6 inches, dark purple; *V. amœna*, 4 inches, dark purple; *V. biflora*, 4 inches, yellow, in pairs interesting and pretty; *V. blanda*, 6 inches, white; *V. canadensis*, 6 to 8 inches, pale blue; *V. cucullata*, 6 inches, dark blue; *V. palm-ænsis*, 4 inches, blue and white; *V. striata*, 6 inches, blue and white.

POLYGALACEÆ.

Polygala (*Milkwort*) is the only genus in this order that furnishes species capable of being cultivated in borders or on rockwork in this country. Of *Polygalas* there are only three with which I am acquainted in cultivation. They may be cultivated on rockwork or in the mixed border in the front lines, succeeding best in light rich loam or loam and leaf-mould. Propagate by division.

Polygala chamæbuxus (*Bastard-Box Milkwort*).—This is a neat and pretty prostrate shrub, with small leathery egg-shaped leaves and numerous fragrant flowers superficially resembling those of some of the pea-flowers, the wings being pale lemon or cream-coloured, and the keel bright yellow. A pretty and interesting plant in rockwork or the front lines of mixed borders, flowering in May, June, and July. Native of the Swiss and Austrian Alps.

P. paucifolia (*Naked-stemmed Milkwort*).—This pretty plant is very rare in gardens. It is a native of North America, grows from 4 to 6 inches high, with stems quite naked below, with a

few small egg-shaped leaves at the top, whence spring the three comparatively large purple flowers with bearded keels which make up the inflorescence. Best adapted for culture on rock-work in sandy peat and loam, or where the soil is congenial it may also be grown in the mixed border. Flowers throughout the summer.

P. vulgaris (*Common Milkwort*).—This pretty little British plant is very variable in size and colour and all the parts of the plant, and has in consequence been divided into several species from British variations alone. The general appearance of the plant is tufted, or diffuse and weak, with numerous small egg-shaped or lanceolate dark-green leaves, and handsome terminal racemes of small flowers, blue, purple, pink, or white, in various shades, and the lower petal or keel having a tiny beard at its tip. It does best on rockwork left very much to itself, although it succeeds very fairly in the front lines of the mixed border in sandy loam and peat.

CARYOPHYLLACEÆ.

The glory of this rather extensive natural order is *Dianthus*, one of the most beautiful and fragrant of herbaceous genera, furnishing as it does the various Pinks, Carnations, and Sweet-williams, and many more simple and less pretentious, but not less beautiful and elegant species, generally rare in gardens, but deserving a place in every collection of herbaceous and alpine plants. But besides *Dianthus* there are other genera, varying much in ornamental features from it, among which we shall find many species fitted for the adornment of the hardy flower-garden, and for other ornamental purposes. There will necessarily be some special directions for culture under the head of various species, but those that immediately follow are sufficient for the majority, the requirements of which are most simple and free from details of a troublesome nature to amateurs—always an admirable point in plants specially recommended to them; and the majority of the plants of this natural order are so. All the species delight most in light rich loam, more sandy than clayey; and they succeed in a variety of aspects, but generally prefer sunny ones;—but these points will be noticed more in detail where necessary afterwards.

Arenaria (*Sandwort*).—This is a low, tufted, or carpet-like growing group, rather extensive in species, but greatly confused

and mixed in their relationships, and, moreover, very generally weedy and of little ornamental value. There are, however, a few sorts well worthy of a little attention, especially from those having to manage light dry sandy or stony soils, and where much rock, natural or artificial, occurs. Easily propagated by seed and division; the seed to be sown any time in spring or early summer, out of doors, either where it is desired to be permanently placed, or in a nursing-bed for the purpose of transplanting at convenience. The division may take place at any time in the growing season, but not so successfully in late autumn or winter, the plants being very liable to be thrown out by frost.

A. balearica (*Corsican Sandwort*).—The whole stature, including the flowers, in elevation above the leaves in this species does not exceed 2 or 3 inches; but it extends rapidly along the surface of the soil in that which is congenial, and to be so does not imply depth nor quality, for it creeps along the face of a stone, or uninviting rock, or sandy bank, much more happily than in rich borders, in which, if the texture is heavy and retentive, it refuses to grow, perishing often in winter. The leaves are bright shining green, somewhat egg-shaped, and succulent. The flowers small, white, and starlike, very numerous, and continuous throughout summer. Native of Corsica.

A. grandiflora (*Large-flowered Sandwort*).—This species is also tufted and carpet-like, with awl-shaped, flattish leaves. Flowers on longish stalks, large, pure white, opening pretty continuously throughout early and late summer. Well adapted to grow in light dry soil, in mixed borders, rockwork, and for clothing sandy bare banks. Propagate by seed and division. Native of the Swiss Alps.

A. montana (*Mountain Sandwort*).—This is a dwarf, diffuse-growing species, with rapidly-extending stems, which do not, however, root in the process of extension so freely as many other Sandworts. The leaves are very narrow, lance-shaped, somewhat downy, and delicately fringed. Flowers large, pure white, one to a stalk, and very profuse throughout early summer. An admirable rock-plant, and very useful and pretty in the front lines of mixed borders in light sandy soil. Propagate by seed and division. Native of France and Europe generally.

Cerastium (*Mouse-ear Chickweed*).—Owing to the great popularity that one of the species has attained by its beautiful effects in combination with gayer-flowering plants in the massing system, this is more widely represented than most of the old-fashioned herbaceous genera in British gardens. The Woolly C., or, as it is more commonly named, "Snow-in-sum-

mer," aids in various ways, in nearly every garden, to bring about the beautiful combinations of colour that are now nothing new, but ever pleasing when accomplished with taste. The family, though a large one, contains many mere weeds unworthy of cultivation, and only two species may be considered admissible into select collections of herbaceous plants, or into flower-gardens. Those two are adapted to grow in almost any ordinarily-good garden soil, succeeding best in that which is rich, light, and comparatively dry, but hardly refusing to grow in the opposite extreme within certain limits; they suffer, however, most in winter from this evil. Propagate by division and seeds and cuttings, as in the Sandworts, and all with the least possible trouble or difficulty. For rockwork, for edgings everywhere, and for masses or carpetings, in association with others in contrast, these are fit plants, and ever beautiful and pleasant to look upon.

C. Biebersteinii (*Bieberstein's Mouse-ear Chickweed*).—This differs from the Woolly C. in its larger size of plant and leaf, and in being more green-grey, and consequently less effective as a massing plant. Individually, it is a bolder plant than the other, and this renders it perhaps more fit for occupying a distinguished place in mixed borders and on rockwork. The flowers are, like those of the Woolly C., white; but when the foliage is the object in culture, it is well to cut them away betimes, as their development is made at some expense of leaf, and the plant remains long seedy after the very brief but usually abundant blooming period. Native of the mountains of Tauria.

C. tomentosum (*Woolly Mouse-ear Chickweed*).—This plant, so well known and universally cultivated, needs no recommendation here; it has already established itself as an indispensable adjunct in garden embellishment so long as bedding-out continues the fashion. Its use in the mixed border or rockwork would necessarily be limited in establishments where these exist along with the massing or bedding-out method; but even then sparingly used as a contrast in front lines of borders and on rockwork, its effect will be found sometimes desirable. Native of the south of Europe.

Dianthus (*Pink*).—Besides the species which have given origin to the florists' varieties of the Pink and Carnation, this family comprises a considerable number of members less illustrious than these, but very beautiful and worthy of general cultivation among mixed herbaceous and rock plants. Very few of these are cultivated except in botanic gardens in this country at the present time. There are not so many of the florists'

varieties of Pinks and Carnations even to be met with in private gardens as in bygone days, certainly not nearly so many as their surpassing beauty and fragrance would warrant the expectation of; and these more simple but handsome forms of nature are still more rare. The various species are not at all difficult to cultivate, although there is a popular belief that only the initiated can hope for a tolerable degree of success with Pinks and Carnations, and that novices will have little besides trouble and vexation for their pains when they take up the culture of these favourite florists' flowers. It does not fall within the scope of this work to write a treatise on the culture of the Pink and Carnations; besides, it is a well-worn topic, and will be found fully discussed from various points of view in different works on florists' flowers, easily obtainable by those who desire more particular information regarding the principles on which they are cultivated for exhibition than may be properly included here. In order to have fine exhibition flowers there must always be vigorous plants on hand from the previous year's propagation, and they must be specially grown either in pots or prepared beds, and the energies of the plants concentrated on the production of a minimum number of flowers. But in growing them merely for the purposes of the ornamentation of the garden, and for cut flowers, the reverse of this is the best practice. The very plants that have yielded exhibition flowers, and which the enthusiastic florist would discard, are just the most fit for our purpose, because at two or three years old the Carnation and Pink produce their maximum of flowers; before that the flowers may be very fine but few, and after that the plants decline in vigour, and often die out. Then instead of being coddled up in pots, or confined to specially-prepared beds, and surrounded by the paraphernalia that is indispensable when they are grown for exhibition, they should be planted everywhere that it is proper to place them, among mixed herbaceous plants for contrast and sweetness, in lines along the walks of the kitchen-garden, or in masses, wherever convenient, for the purpose of cutting for room adornment. These remarks apply in the main to the Carnation and the Pink, but all Pinks are proper for such purposes, and for planting on rockwork, and on the margins of shrubbery beds or borders—everywhere, in fact, that colour and sweetness are desirable. The propagation of the large-growing kinds of the Carnation type is best effected by layers made in July or August, and the Pinks generally are easily increased by cuttings at the same time or earlier, planted in sandy soil under a glass on the north side of a wall or hedge, where they may escape the direct rays of the

sun for the greater part of the day. The soil in which the Pink family succeeds best is a rich sandy loam, but they do very well in many kinds of soil if not excessively wet in winter. In summer they suffer from drought very quickly, and should be allowed an abundant supply of water, if they appear to require it; and in light dry soils they will be benefited by a mulching of old manure placed over their roots in that season.

D. alpinus (*Alpine Pink*).—A very dwarf species, growing only 3 or 4 inches high, with oblong blunt leaves and large deep-rose flowers blotched with deeper red, one flower to a stem, and the petals notched on the margin. A very beautiful and distinct sort, flowering in June and July. Best adapted for rock-work in light rich sandy soil in which well-decomposed vegetable matter abounds. Leaf-mould should be avoided in planting it, however, owing to the prevalence of wire-worms in it, which are one of the greatest pests of this and all Pinks. A little good peat is the best to add to the soil if it is deficient in vegetable matter. Where the soil is suitable, it may also be tried in the mixed border; but only where it is naturally or otherwise well drained should this be attempted. Native of the mountains of Austria.

D. arenarius (*Sand Pink*).—This is similar in habit to the last, but has linear rather sharp-pointed leaves. The stems are one-flowered, as in the last species; the petals are purple and fringed. Adapted to adorn either the rockwork or mixed border in very sandy soil, but requires abundant supplies of water in summer. Flowers from June till August. Native of many countries of Europe.

D. barbatus (*Sweet-william*).—Although this time-honoured inhabitant of gardens is probably best treated as a biennial, it is a true perennial, and for this reason, as well as on account of its great ornamental qualities, it deserves a place here as well as in every garden in the country. It is too well known to need description, and too much admired to need praise; it recommends itself powerfully enough by the endless and elegant variety of its flowers. Besides the beautiful single varieties, there are numerous very handsome double ones, which, as they last in bloom much longer, and never assume the seedy aspect which forms the only drawback against Sweet-williams being cultivated in more distinguished positions than they are usually favoured with in most gardens, may be considered improvements, in so far as they may be used in more select arrangements than the others are fit for. The better double sorts should be increased annually by cuttings, but doubles of fair

quality may also be procured by seed, which should be sown in spring or in July, or both, for the purpose of securing succession. Some of the earlier sowing will be found to bloom in the autumn, if it has been made early; and in mild places they will be very welcome then, as they will continue well into winter if the weather is favourable. If the seed is sown in March, a cold frame or hand-glass should be devoted to it, and it may be sown broadcast or in lines, in the frame or in pots, according as the quantity needed, and the convenience in other respects, may determine. In July they may be sown in the open ground in a reserve spot, or at once where they are to flower, but they are better for being transplanted, and on this account a nursing-bed and a little trouble in pricking out the seedlings are advisable. Native of Germany and other parts of central and southern Europe.

D. caryophyllus (*Carnation or Clove*).—This is the parent of the Carnation, Clove, and Picotee in all their splendid varieties, so much and deservedly esteemed for the handsome form, brilliant colours, and delicious fragrance that distinguish them above nearly every other cultivated flower. As seen in nature, this species forms considerable tufts of linear glaucous leaves, with weak straggling stems a foot or more high, and purple or white flowers. But the parent would not be tolerated beside the progeny in gardens; its capabilities for ornamentation would be on trial, indeed, alongside even inferior varieties that have sprung from it. The varieties are very numerous, many hundreds have been named, but, like all more than ordinarily variable flowers which have received much attention from florists, there is much similarity of feature between the individuals that form large collections; and for the purposes of decoration a few distinct sorts of hardy constitution selected from the different races of Clove, Carnation, and Picotee, will be found more satisfactory than collections of trivially-defined ones. The Cloves, red and white, are the most fragrant, the true Carnations—that is, the bizarres and flakes, as they are named by florists, according to the style of their colouring—and the Picotees are only less sweet, but the great beauty and variety of their flowers compensate somewhat for that deficiency. All these races of the Carnation are rather difficult to cultivate in heavy wet soil. The Picotee is less troublesome to keep up in such than the others, but they are all more liable to perish in winter than when placed in drier sandier earth. Of course, means obvious enough can be taken to preserve the old plants even in the worst of soils through the winter, and stock should be made by layers every season to make up gaps that will

inevitably occur under the best management and in the most favourable soils. In summer, when needful, they should receive a mulching of old dung above the roots ; and this is especially necessary in dry soils, and in the case of young plants particularly. The Carnation is doubtfully a native of England ; it is found growing on old walls, and in other positions in different parts of the country, but is more abundant on the Swiss Alps and the west of France.

D. cæsius (*Grey or Cheddar Pink*).—A densely-glaucous species, growing in close symmetrical tufts with short linear blunt and stiff leaves. The flower-stems, 6 or 7 inches high, are very erect, usually one-flowered ; the flowers, large, rose-coloured, and sweet, appear in May, June, and July. Native of Britain,—but rare, at least local,—and of other countries of Europe. It is exceedingly impatient of wet, and does not succeed well in the mixed border unless it is so dry as to be unsuitable for most other plants, but thrives well on dry rockwork. In nature it affects old walls and volcanic and limestone rocks, a circumstance suggestive enough of the treatment it should receive in cultivation.

D. cruentus (*Bloody Pink*).—This species is nearly related to the Sweet-william, but is scarcely so robust in growth. The leaves are narrower and less flaccid, but the dense umbel-like heads of flowers are the same in style, and the colour of the flowers intense dark crimson. It grows from 1 foot to 18 inches high, and flowers in June and July. Native of southern Russia. Best adapted to cultivation in the mixed border.

D. dentosus (*Toothed Pink*).—This is a very distinct species, dwarf and tufted, with bold glaucous leaves, the stems rising 6 or 8 inches high. The flowers are large, purplish, with a darker centre, the edges of the petals notched. A very beautiful plant, adapted specially for culture on rockwork, but succeeds well in warm dry borders also. Flowers in May, June, and July. Native of Siberia.

D. hybridus (*Mule-Pink*).—This is supposed to be a hybrid between the Carnation and the Sweet-william ; but whatever its origin, there are a number of beautiful varieties included in the name, and more or less of them should be grown in every garden where cut flowers are much in demand. They may be treated as to soil and propagation the same as other Pinks.

D. neglectus, syn. **D. glacialis** (*Glacier Pink*).—A very diminutive but beautiful and rare species, from the loftiest positions on the Swiss and Tyrolese Alps. It is of close tufted habit, with very short grass-like leaves slightly glaucous, and the very

short stems crowned with large pure rose-coloured flowers. Adapted only for culture on rockwork, or in pots.

D. petræus (*Rock Pink*).—A dwarf tufted species growing about 6 inches high, producing rather dense masses of hard narrow leaves sharply pointed. The flower-stems bear usually but one large pink flower, the margins of the petals being deeply and irregularly cut. Flowers in July and August. Native of Hungary, and adapted to either the rockwork or mixed border in sandy but moist soil.

D. plumarius (*Garden Pink*).—This is the reputed parent of the varieties of the florists' Pink, but there is reason to believe that other species have had a share in the production of them; for although the race more especially cultivated for exhibition, and called Pheasant's-eyes by the florists, may be reckoned unmistakable progeny of *plumarius*, there are many sorts which cannot be classed with these, and seem to have strong relationship to *deltoides* and other species near it in character and the Carnation. To enumerate varieties and make selections here would be an endless and not a very satisfactory task. These, along with all florists' flowers, have large additions of new claimants for honours annually brought to their ranks, which, whether improvements or not, for a time hold a place, and disturb or displace older varieties in the collections of private growers. It is best for the purpose merely of adorning the mixed border and rockwork to select those that are hardiest, and that grow and flower freely, irrespective of fine flowers, as popularly judged. Among these, the best that I know are the old fringed white and red, very double flowers, and sweet and early, lasting also long, and growing well in almost any kind of soil. Anne Boleyn is admirable for the beauty and fragrance of its flowers where it grows well, but is difficult to manage in heavy wet soil; and there is a race of perpetual-flowering Pinks that are valuable both for their sustained blooming habit and adaptability to forcing. Garibaldi, with the habit of Anne Boleyn, is one of the finest of these. *D. plumarius*, in the normal state, is not worth growing beside most of its varieties. It is a very glaucous diffuse-growing plant, with very few flowers to the stem. The flowers are white, with a dark-purple centre, and the petals fringed on the margins. Flowers in summer. Native of many parts of Europe, and is naturalised in some parts of England on old walls and rocks.

D. superbus (*Superb Pink*).—This beautiful species is distinguished at a glance by the peculiarity of the petals being pinnately divided for half their length. The stems are erect, $1\frac{1}{2}$ foot high, surmounted by a loose panicle of the pecu-

liar flowers, which are large, pink, or purplish, and white, and fragrant. Most suitable for the mixed border in very light dry soil, it is impatient of wet in winter, and from this cause liable to destruction. Stock may be kept up by cuttings and by seed; and the latter, in the way recommended for Sweet-williams, is the best method to adopt in order to keep up unfailing supplies. Flowers throughout summer till late. Native of many countries of Europe.

Gypsophila.—This genus is characterised more by grace than striking beauty of flowers. The flowers are small, but produced in great numbers in loose graceful panicles. They are plants that are easily cultivated in any common garden-soil, and are propagated by division and seeds, the latter in the open ground in spring.

G. fastigiata (*Peaked G.*)—This species grows from $1\frac{1}{2}$ to 2 feet high, the stems upright and leafy, the leaves being linear and somewhat angular. Flowers in loose terminal corymbs small and white, appearing in June, July, and August. Native of many parts of central Europe.

G. prostrata (*Trailing G.*)—This is a pretty species for rock-work or the front lines of the mixed border. It grows in spreading masses of glaucous leaves, which are linear-lanceolate in form. The flowers, white or pink and small, are borne on very slender stems in loose graceful panicles, and continue to appear from midsummer till September. Native of the Alps generally and Siberia.

G. Steveni (*Steven's G.*) grows about 18 inches to 2 feet high in diffuse habit, with glaucous grass-like leaves. The flowers are gracefully paniced and white, appearing in July and lasting a few weeks. Native of Iberia.

Lychnis.—This group, though not numerous, comprises some very beautiful plants for the mixed border and rockwork. In cultivation they are best suited with moist, rich, but light loam; some of the species, in fact, delight in moist boggy pastures in nature. Like the varieties of Pink and Carnation, the species and varieties of this family are most beautiful as border plants when two or three years old, either from cuttings or division, and they are all easily managed by division in early autumn or spring. Cuttings are not so easily managed, but if they should be resorted to, the best plan is to cut down the flowering-stems before they have become too hard and lost their leaves; then cut them into lengths of two joints, taking care to cut up to the solid of the lower joint, and treat them afterwards as Pink cuttings. They are often slow to strike, but must be waited for.

L. alpina (*Alpine Lychnis*).—A very dwarf species growing in tufted masses about 6 inches high, bearing its beautiful pink flowers in close heads. The leaves are lanceolate and not viscid, and the petals are deeply cut into two. Best fitted for culture on rockwork in sandy loam and peat. Flowers in spring and summer. A very local native of Britain, being found only on the top of Little Kilrannoch in Forfarshire, but enjoys a wide distribution in central and northern Europe and Asia, but only on the loftiest mountains of the former.

L. Bungeana, syn. **Agrostemma Bungeana** (*Bunge's Lychnis*).—A very handsome brilliant scarlet species. It grows about 18 inches or 2 feet high. The leaves are broadly lance-shaped, slightly downy. The flowers are large, the petals spreading and deeply cut on the margin: they appear in summer and last a month or two. It likes well-drained yet moist soil, sandy but rich. Native of north-west Asia.

L. chalcedonica (*Scarlet Lychnis*).—This is a stately and beautiful species, well known in most gardens. It grows about 3 feet high, with broad lanceolate leaves opposite on the stems, which make usually an abortive attempt at branching on alternate sides of the stem. The flowers are brilliant scarlet, in dense crowded heads, appearing in June, July, and August. There is a white variety, which may be grown for variety's sake in large collections, but is worthless as compared with the scarlet. The doubles in both scarlet and white are the best; they are more striking and last much longer. It grows in any good garden-soil, and all the better for biennial removal into a fresh position. Native of Russia.

L. coronaria, syn. **Agrostemma coronaria** (*Rose Campion*).—A tall rather coarse plant, scarcely worth growing but in large collections. It is erect in growth, 2 or 3 feet high, with downy stems and leaves, and large reddish purple or crimson flowers solitary on long stalks. There is a white variety and a double crimson, the latter dwarfer and more compact than the type, and a very handsome plant worthy of a place in even select collections. Native of the south of Europe. Flowers from early summer till autumn.

L. flos-cuculi (*Ragged Robin*).—The double form of this common plant is a charming ornament to the mixed border or rockwork. It should be well known that this *Lychnis* is abundantly native of our country, and adorns the moist banks of streams and wet meadows with its pretty pink blossoms for a great part of the summer. The double variety is worthy of a place in any garden, both for the continuity of bloom and the bright pleasing flowers so freely produced by it. The

plant grows about 1 foot high, in easy graceful habit, the stems being clothed at the joints and the top with dense panicles of the characteristically ragged flowers, the petals being deeply cut and jagged. Native of Europe generally.

L. fulgens (*the splendid Lychnis*).—This fine species grows about 18 inches or 2 feet high, with erect hairy stems and leaves, and large brilliant scarlet flowers, two or three together. They appear throughout the summer. Suited for mixed borders, and in moist light soil it is a brilliant plant. Native of Siberia.

L. Lagasce.—This is a beautiful species from the Pyrenees. It is a dwarf-tufted plant with short branching stems and beautiful bright rose or pink flowers with a white eye. It is a recent introduction to cultivation, and one of the finest of the group. It should be grown in very sandy loam in a well-exposed position, but moist on rockwork. Flowers in summer.

L. pyrenaica, syn. **Agrostemma pyrenaica** (*Pyrenean L.*)—A tufted diffuse plant with decumbent stems and tough leathery leaves. The flowers are produced in forked bundles, having one flower in each fork on a long stalk; they are rose-coloured, and appear in early summer, lasting for a couple of months. Height about 9 inches. Native of moist rocks on the Pyrenees.

L. Viscaria (*Clammy Lychnis*).—Although a very pretty plant in the natural condition of single flowers, this is much more ornamental in the double-flowered variety, and more valuable on account of the greater duration of the flowers. It is an erect-growing plant 1 foot or 18 inches high, with narrow lanceolate leaves in dense tufts, but few and shorter on the stems, which are clammy above. The flowers, rosy-red, are borne in almost stalkless clusters at the joints, on the stems, and at the top. There is a double-white variety, but rather rare as yet; both are beautiful plants for the mixed border, and succeed in almost any kind of garden soil. Native of Britain in a few localities, and generally of central Europe. Flowers from early till late summer.

Saponaria (*Soapwort*).—This genus comprises, besides a few annuals, four or five perennial species, most of which are in cultivation. None of them may vie with the annual *S. calabrica* in massive showiness and continuity of bloom, but they are very beautiful, and worthy of culture in any select collection. Exception may be taken to this last remark on account of *S. officinalis*, which is rather encroaching in its habits by reason of its underground stems, which make incursions in all directions if means are not taken to keep them within limits by the aid of a pot plunged in the border, or some such contrivance. The Soapworts are easily increased by cuttings in the growing

season, under a glass in shade, and by division, but some, owing to the woody tap nature of their roots, are not safe to divide.

S. cæspitosa (*Tufted Soapwort*).—A dwarf species forming dense carpet-like tufts of stems and leaves 3 or 4 inches high, and producing its pretty bright rose or pink flowers in close umbel-like heads at the ends of the stems. It is best fitted for culture on rockwork, in partial shade, in peat and loam, sandy but moist. Flowers in July and August. Native of the Pyrenees.

S. ocymoides (*Basil-like Soapwort*).—This pretty plant grows in rounded cushion-like masses with dark-green leaves, and produces a profusion of bright pink flowers throughout late spring and the greater part of summer. In some trade-lists I have seen it erroneously stated as being biennial: it is a true perennial of great hardiness, and adapts itself to almost any position, either on rockwork or border, in tolerably rich sandy loam well drained. Native of central and southern Europe.

S. officinalis (*Common Soapwort*).—This species is a native of Britain. It grows erect about 2 feet high, with stout stems clothed with long acutely-oval leaves, and the flowers in dense heads at the top of the stems are pale soft pink. As already stated, it is somewhat encroaching in its nature, and on that account may not be allowed in choice collections, but it is well adapted for naturalising in semi-wild places, on banks where not much shade exists. Thrives in any common soil, and flowers the greater part of the summer.

Silene (*Catchfly*).—This is a very extensive group, embracing many very elegant and some brilliant plants fitted for a variety of ornamental purposes, but many also that are weedy and quite useless in gardens. There are not a great many of the most beautiful species in cultivation; a few of the best, however, are in our hands, along with some that should not rank high as ornamental subjects. The Catchflies are mostly easy to cultivate in rich sandy loam, but the requirements of the species will be noticed in particular under each; and it is only necessary to remark here that they are propagated by division and cuttings; but division with certain species having woody, almost simple rootstocks, is not a safe measure, except in very old and well-established plants, which have increased so as to offer breadth of crowns for the purpose. Cuttings of those species with trailing stems are easily managed any time they can be got during summer in the way so often described for such plants, but division in such cases is nearly always easy and safe, and being less troublesome, will most likely be preferred, excepting very large increase is contemplated, when

cuttings or seed must be resorted to. Seed may be sown in February or March in cold frames, or in the latter month and in April in the open ground; but many will flower the first season if sown in the first-named month in cold frames, and they are properly attended to in the matters of timeous pricking out and watering till they can take care of themselves. Division is best accomplished in early spring.

Silene acaulis (*the stemless Catchfly or Cushion Pink*).—This species grows in dense moss-like tufts 2 or 3 inches high. The flowers, very numerous, with very short if any stalks, are reddish purple or pink. Best adapted for culture on rockwork in moist rich sandy loam. Flowers from June till August. There is a variety named *S. a. alba*, which, though not so sparkling as the normal colour, is well worth growing for contrast sake; but the other variety sometimes seen in cultivation, named *S. a. exscapa*, is only a little more pigmy and dense than the parent, without any other feature worthy of consideration to the flower-gardener. Native of Britain, rather abundant in some parts, but rare in others, and enjoys a very wide and general distribution in northern Europe, Asia, and North America.

S. alpestris (*Alpine Catchfly*).—This species grows about 6 inches high. The stems are leafy, the leaves narrow lanceolate or linear, and simple till near the top, when they branch out into an open panicle of pure-white flowers, supported gracefully on longish thread-like stalks. The flowers appear in May, June, and July. Propagate by division in early spring. Best suited for rockwork or the front lines of the mixed border in rich light sandy loam, deep and moist, but well drained, and in a sunny exposure. Native of the Austrian Alps.

S. Elisabethæ (*Elizabeth's Catchfly*).—This is a very distinct and lovely plant, growing in tufted fashion, with masses of slightly-hairy leaves, the stems terminating in a loose panicle of few but large brilliant rose-coloured flowers. The flowers appear in July and August. My experience of this plant in cultivation is not yet very complete, but on rockwork it will no doubt be found to thrive well in the soil recommended for those species immediately preceding. Propagation may be effected by seeds, and by division when the plants are strong enough to be risked by that process. Native of Italy and the Tyrol.

S. fimbriata (*Fringed Catchfly*).—A very distinct species, growing about 18 inches or 2 feet high, with erect but graceful stems, clothed with egg-shaped or lanceolate leaves, and surmounted by panicles of white flowers, the calyx much inflated and the petals much and deeply fringed. Adapted for the inner

lines of mixed borders in any good garden-soil. Flowers from early till late summer. Propagated by division in early spring. Native of the Caucasus.

S. maritima (*Sea-coast Catchfly*).—This is a peculiar variety of one of our native plants, the *S. inflata*, so peculiar indeed as to be regarded as a good species by many botanists; and in so far as ornamental features are concerned, gardeners will side with them in pronouncing it very unlike and much better favoured than its reputed parent. The plant forms flat turf-like masses of pale or milky green leaves. The flowers are pure white, usually solitary on the stalks, with much-inflated or bladder-like calyces. The double variety is the most handsome, and being only 3 or 4 inches high, is best adapted for draping rockwork in tolerably moist positions in very sandy soil, or for the front line in mixed borders. May be increased by cuttings and division. Flowers early and late in summer.

S. pennsylvanica (*Pennsylvanian Catchfly*).—This grows in prostrate fashion, with stems 6 to 9 inches long, and rising a few inches high, the stems being clothed with lance-shaped leaves. The flowers are borne in loose terminal clusters, the calyx not inflated, the petals reddish purple, notched and toothed. A fine species for either rockwork or border, but being fond of slight shade may not so easily be found a fit position in the border as on rockwork, where more choice in this respect may be had. Native of North America—rather abundantly distributed in many parts. Flowers in spring and early summer.

S. quadridentata (*Four-toothed Catchfly*).—A graceful softly-tufted species, growing a few inches high, with erect slender stems, bearing numerous small white flowers, the petals being regularly 4-toothed. The flowers appear in spring and early summer. A suitable ornament alike for rockwork or the front line of the mixed border. Native of the Alps. Propagate by division in spring.

S. Schafta.—This species has rather a woody root-stock, whence spring many ascending, not erect stems. The stems are clothed with sharp-pointed leaves, narrowing to the base. The flowers are produced singly or in pairs on one stalk, calyx not inflated, petals large reddish purple, and appear from July till October. A valuable free and continuous flowering species, which, as it is easily accommodated as regards soil and situation, may be used with excellent effect in bedding arrangements, while as a rock or border plant it is bright and beautiful. Propagate by seed and cuttings. Height about 6 or 9 inches. Native of Russian Asia.

S. virginica (*Virginian Catchfly*).—About 18 inches high,

with ascending, not erect, rather straggling, but not ungraceful stems, which are brownish, slightly hairy, and clammy, and clothed with lance-shaped leaves. The flowers are numerous, in gracefully-spreading panicles, calyx not inflated, corolla large, brilliant purplish scarlet, the petals deeply notched in two. A most ornamental species, best fitted for culture in the mixed border. Flowers appear from midsummer till autumn. Propagate by division and seed. Native of North America.

Spargula (*Spurry*).—This is a small genus of very diminutive plants, which I hardly dare introduce here but for the fact that one of the species, *S. pilifera*, was introduced ten or twelve years ago as a fit and proper substitute for grass in the formation of lawns, and for verges and every other purpose for which we thought nothing was better than good grass. There was a good deal of controversy over it at the time, and some of the advocates of the innovation said very strong things in support of it. The necessity for mowing was for ever to be done away with, scythes and mowing-machines to be consigned to antiquarian museums, and posterity would bless the nameless but happy man who first drew the attention of an over-practical and sceptical generation to a long-neglected good. These are some of the sentiments indulged in by the advocates of the new idea; and now it has become old, and experience has proven that the utterances in favour of it were not facts, and that the little Spurry was in no way fitted to take the place of grass where grass should be. When in good health the plant looks very fresh and beautifully green and carpet-like, but it has an unfortunate habit—unfortunate at least in a plant recommended to take the place of grass—of smothering itself for a month and a half in summer with small starry pure-white flowers, which would be simply intolerable in acres wide under a July sun. But the plant is very pretty, and suitable for clothing dry banks where very low herbage is desired. It grows about 2 inches high, in close moss-like tufts, and rapidly spreads itself in sandy soil, but is ever patchy-like in heavy loams, especially if inclined to be moist. There is no other species worthy of notice for any ornamental purpose, and *S. pilifera* is surpassed in fitness for every purpose for which it was recommended by grass and other plants which we resort to for edgings, &c. Native of Corsica.

Tunica.—There is only one species, *T. saxifraga*, that is worthy of notice here. It is a pretty, dwarf, alpine plant, with wiry somewhat prostrate stems, clothed with linear, hard, bristly leaves, and forming rather dense rounded tufts. The flowers, individually small, are very profuse and continuous for two or

three months in summer, and bright pink. It is sometimes called *Gypsophila saxifraga*, and is an elegant little plant for rock-work, or front lines of borders, or small beds, in some secondary massing arrangement, as it bears the sun and all kinds of weather well; and, in fact, delights in the fullest exposure, and prefers a light sandy but rich soil. Propagate by seed and division. There is a double-flowered variety in cultivation, but not yet plentiful. Native of the Alps and Pyrenees.

LINEÆ.

Besides being of immense value in manufactures, the Flax family is, for its bulk in species, one of the most brilliantly ornamental of those that furnish hardy herbaceous subjects. Of the three genera comprised in the order, two of them are represented in the British flora, *Linum* and *Radiola*, the latter an interesting annual, but with no pretensions to beauty. *Linum* is therefore the only group to which we can turn for a selection of hardy plants, but there are not a few species in it that are very beautiful and hardy. There are not a great number of the species—that is, perennial ones—in cultivation, but there are several of the best in gardens, though not often seen. Their culture is very easy. They require a good, rich, sandy loam, dry rather than otherwise, and one or two are the better for a mixture of peat or leaf-mould, well decomposed, incorporated with the loam. Some are suitable for rockwork adornment; others are more congenially circumstanced in the mixed border, where the soil is proper; and some of them are not fastidious as to the quality, if it is not liable to stagnation by wet. All may be propagated by seed easily, which they generally produce freely, and by cuttings taken before the stems are too old and hardened, but sufficiently firm to avoid the risk of damping, to which they are liable when too soft and succulent. There is a safe medium, which cannot be described in words, nor can a time be named for taking them in all localities, as the growth will vary much in different places; but a little observation and experience will serve to guide the earnest amateur in this seemingly difficult point, in which, however, there is really less difficulty in practice than in description. If the cuttings are taken early in the summer, they should be treated in the same way as described for Pinks and cuttings of hardy subjects generally, being placed in sandy soil under a hand-light, in partial shade,

or where they may be shaded from strong and direct sunlight, and the very soft point of the cutting be removed; if taken late they will be more successful if placed on slight bottom-heat, shaded, and kept close till they show signs of growth, when they will require a little air, and the shading gradually discontinued. The seed may be sown in pots in a cold frame, in March or April, in the open border, or where the plants are designed to remain, and seed will be found the least troublesome means with amateurs.

L. alpinum (*Alpine Flax*).—A very dwarf species, with numerous almost prostrate stems, clothed with linear, short, sharp-pointed leaves. The flowers are dark blue, in terminal clusters, appearing in summer for about two months. A very pretty plant for rockwork in sandy loam and peat in a dry sunny position. Height 6 inches. Native of most of the mountainous parts of Europe.

L. arboreum (*Shrubby Flax*).—This is a dwarf somewhat shrubby plant with rather straggling habit and milky-green egg-shaped leaves. The flowers are borne in sparse terminal clusters, bright yellow, the petals somewhat pointed. Flowers early and late, and continuously in summer. It is a fine showy plant for rockwork. My experience of it only embraces observations made in the neighbourhood of London, and I should hesitate putting it in any exposed position north of that locality. There, and southwards, it will be perfectly safe in the mixed border, and will form a most pleasing addition to it; and northwards also, in very favourable dry sunny places, or warm sheltered sea-coast localities, it may be safe; but while stock is limited it should have the protection of a cold frame or hand-glass, and mat or dry litter in winter in severe weather. Height about 18 inches. Native of mountains in Asia Minor, S. Europe, and N. Africa.

L. austriacum (*Austrian Flax*).—Where space is limited, and the Alpine Flax cultivated, this may not be worthy of a place; but if the collection is a large one, it will be found distinct and useful for certain purposes in which the other is not so suitable, and especially as a mixed-border subject will its larger and more robust nature be useful in the less favourable localities for alpine plants. The flowers are the same colour, and appear about the same time, as those of the Alpine Flax; but the plant is taller by a few inches, and more spreading in habit. Native of Austria.

L. campanulatum (*Bell-shaped Flax*).—This species grows about 18 inches high, with broadish lanceolate milky-green leaves clothing the numerous not very erect stems. The flowers

are bright golden yellow in terminal clusters, appearing in June and lasting till August. Best suited for sunny positions on rockwork in the northern counties; but about London and southwards will succeed well in the mixed border in light dry sandy peat and loam. Native of southern Europe.

L. hirsutum (*Hairy Flax*).—Only a very small portion of this species is hairy. The calyx enjoys a hirsute covering, but other parts of the plant are hairless. It grows from 18 inches to 2 feet high in masses of spherical outline. The leaves are somewhat egg-shaped or broadly lanceolate. The flowers are large, somewhat bell-shaped, purplish blue, and appear in terminal trusses in June, and last a month or two. Native of the Pyrenees. Adapted to border culture and rockwork in light sandy loam.

L. monogynum (*One-styled Flax*).—This is a beautiful pure-white flowered species, rising rather erect about 18 inches, with numerous stems, clothed rather thinly with narrow lance-shaped leaves acutely pointed. The flowers are large in terminal corymbs, and appear in the summer months. Best adapted for rockwork in warm positions, and in the south may be tried everywhere in moderate shelter.

L. narbonnense (*Narbonne Flax*).—This species grows about 18 inches high, with the stems branching much at the base, and clothed with lance-shaped rough-margined acutely-pointed leaves. The flowers are borne in loose graceful trusses, are large and pale blue, with lines of darker hue radiating from the claw of the petals outwards. A fine showy species for rockwork or border, flowering in early summer and continuing for a month or two. Native of the south of France.

L. perenne (*Perennial Flax*).—This species is a native of Britain, but not common. In nature it is variable, and in gardens there are several species so called, which, while differing in some unimportant characters, are too close in resemblance to the form called *perenne* to be admissible in any but botanical or very extensive collections along with it. *L. perenne* grows about 1 foot high, with numerous slender, almost prostrate stems, clothed with small linear sharp-pointed leaves, and the flowers are bright blue in graceful open trusses at the top of the stems. They appear in the summer months early and late. There is a white variety which has long been cultivated, and there is a more recent variety with rose or pink flowers, both of which are well worth places and some attention. Some of the species alluded to above as too near *perenne* to be admitted in select collections along with it, are, *Lewisii*, *provinciale*, and *sibiricum*, neither of which presents features superior to those of *perenne*.

MALVACEÆ.

In this natural order there are not many herbaceous perennials of value to flower-gardeners. The perennials generally are characterised by roughness and bulk, or by absolute weediness. There are some pretty annual plants and handsome shrubs, but with these we have nothing to do here. Some of the gross perennials are well fitted, however, for naturalising in open places in woods, where variety of foliage and habit may be desired along with a little colour. Their robust habit and accommodating nature adapt them well for such a purpose, as little preparation will be needed for them in most cases if strong tufts are planted out.

Althæa.—This is a small genus of usually tall-growing plants, very few of which are perennial, the majority being annuals and biennials,—one of the latter, *A. rosea*, being the parent of the varieties of Hollyhock.

A. narbonneensis (*Narbonne A.*)—This species grows to the height of 4 or 5 feet, and has the stems clothed with five-lobed leaves, very downy. The flowers are borne in panicles in the axils of the leaves on the upper part of the stems; they are large, bright pink, and produced in great numbers in autumn. Propagate by division. Any common soil agrees with it, and it is fit only for naturalising in open spots in woods, or for furnishing a little colour among shrubs. Native of many countries of southern Europe.

Cristaria coccinea.—So far as I am aware, this genus contains only the species named; and it is very rare, if in cultivation at all, in this country. It is a very pretty plant, with stems 6 to 9 inches in length and bluish-green leaves, smooth, and much divided into deeply-cut lance-shaped segments, which are again cut or lobed. The flowers are numerous in the axils of the leaves on the upper part of the stems on short stalks. They are bright scarlet, and the lobes of the corolla obcordate, and appear late in summer. In the north it should be planted in peat in a sunny position on rockwork, in the south it will succeed in any tolerably warm border in peat. Propagate by division and seeds, both in spring, the latter in a cold frame, when they will flower the first year. Native of the Southern States of America.

Kitaibelia vitifolia.—I am not aware of there being any other species of this genus. It is a large-growing plant, reaching the height of 4 or 5 feet, the stems clothed with abundance

of sharply five-lobed vine-like leaves, and producing large white flowers, one to a stalk, in the axils of the leaves in the upper parts of the stems. The flowers appear in early summer and continue late. The plant is too gross and not showy enough for select borders; but is well adapted for culture among shrubs, and for introducing into open spaces in woods. Propagate by division. Native of Hungary.

Malva (*Mallow*).—In this family we have a little more that is beautiful to select from than we had in any of the preceding genera. It is a rather numerous group, but in the hardy section of it there are many weedy plants both annual and perennial; but there are also a few among the latter worthy of culture for different purposes of ornament. They are propagated by division and seeds; other particulars of culture will be given under the different species.

M. cordata, syn. **Nuttalia cordata** (*Heart-leaved Mallow*).—This species produces stems from 18 inches to 2 feet long. The leaves below are bluntly heart-shaped in outline and are deeply cut, those above become reduced to three narrow lanceolate lobes. The flowers are pink, and appear in summer and autumn. Native of North America. This is a handsome plant when at its best, but is apt to become seedy soon, and exhausts its flowering energies in a short time; it is therefore only suited for secondary purposes, such as giving temporary effect to shrubbery borders in not much frequented parts of gardens. Succeeds in any good garden-soil if moderately dry.

M. involucrata, syn. **Nuttalia involucrata** (*Involucrated Mallow*).—This species produces stems 18 inches or more long, rather prostrate and straggling in habit, clothed with three-lobed leaves heart-shaped in outline, the lobes cut into sharp segments. Flowers on long foot-stalks, one to a stalk, in the axils at the extremity of the stems and branches; purple, with a creamy-yellow centre. This is a handsome plant, but not, I fear, capable of withstanding the winters of the north, especially of Scotland, without protection of some kind. It is fond of peat, and should have a warm sunny position. Propagate by division in spring, and by seed: if sown early in March it may be had in bloom the first year. Native of the Southern States of America. Flowers in summer.

M. lateritia (*Brick-red Mallow*).—This species is prostrate in habit, with hairy stems and leaves; the leaves, on long stalks, are five-lobed below and three-lobed above. The flowers, red, are on long stalks, and appear in autumn. A very handsome dwarf-plant, suitable for culture on warm rockwork or borders in the milder parts of the country, in sandy peat

and loam. Propagate by division and seed. Native of Buenos Ayres.

M. moschata (*Musk-scented Mallow*). — This is an indigenous species, occurring frequently in dry gravelly places. It is rather a large-growing bushy plant, with erect stems, branching, if luxuriant, freely, with kidney-shaped lower leaves cut into blunt broad lobes; the upper ones are more deeply divided into narrower and sharper segments, which are again often divided. The flowers are large, rose-coloured, in crowds at the extremities of the stems and branches. There is a white-flowered variety more common even in gardens than the rose one. Although not a select plant, this will be found very useful in larger collections, and would be valuable for introducing colour where wanted in semi-wild places, about parks, on the fringes of woods or shrubberies. The leaves, when pressed or rubbed, emit a faint odour of musk. Flowers in the summer months. Propagate by division and seeds, and if sown in pots in a cold frame early in March, will blossom the first season. Ordinary soil suits quite well.

There are other fine species of Mallows which have been in cultivation, but are at present lost, or very rare; most of the best, however, require some protection in winter, or are only fitted to exist in the mildest parts of Britain. Some of the finest of these are noted below:—*M. campanulata*, very distinct and handsome, with stalkless, almost pinnate, leaves and lilac bell-shaped flowers, produced continuously for months in summer. Native of Buenos Ayres. *M. Munroana*, the whole plant downy, with roundish heart-shaped leaves, the flowers scarlet, in crowded masses at the extremities of the stems and branches. Native of Columbia. *M. Paxtoni*, a fine species, with deeply-lobed leaves, and the flowers, red, crowded in leafy masses at the extremities of the stems. Native of Texas.

HYPERICINÆ.

The typical genus of this natural order is the only one in which we may find plants of an herbaceous character, and ornamental. It is an extensive genus, abounding in highly ornamental shrubs and under-shrubs, and a few herbaceous perennial plants. The latter are, as just stated, few in number, nor are they generally so showy as some of the dwarf shrubby species; and as these are in many cases, by reason of their

low compact growth and showy flowers, fit to associate with herbaceous perennials, and are besides by their nature adapted to ornament woods, banks, and rocky places, in shade or sunshine, in any soil and every situation, there is no reason why we should not draw in our selection on them, while we select also the best of the herbaceous ones. Notwithstanding the large number of species comprised in the family, and the very generally beautiful and showy character of the flowers, only one or two of the St John's-worts are to be met with frequently in private places; and although they are more numerous about botanic gardens, it might be expected to see so fine and useful a genus more largely represented everywhere. The herbaceous species are propagated by seed and division in spring, the shrubby ones by both means and by cuttings in August or September, put thickly in rows in a well-dug border.

Hypericum Androsæmum (*Tutsan St John's-wort*).—This plant has a strong woody or shrubby base, but with annual or herbaceous flower-stems. These rise erect about 2 feet high in cultivation, generally branching somewhat. The leaves are bluntly egg-shaped and stalkless. The flowers are in terminal corymbs, clear yellow, and appear in June, lasting till late autumn. The plant is most useful for introducing into open woods and rough places elsewhere in any kind of soil. It is indigenous, but confined to western Britain and the south of England and Ireland.

H. calycinum (*Large-flowered St John's-wort*).—This species is also popularly named *Rose of Sharon* and *Aaron's Beard*, from the dense bundles and hair-like appearance of the filaments within the corolla. It is perhaps the handsomest species of the family. It grows a foot or 18 inches high, with numerous apparently simple stems, which, however, branch freely at the base, and are clothed with large oblong almost stalkless leaves, shining dark green. The flowers appear at the extremities of the stems, one or two together in weak plants; but in tolerably good soil the plant acquires more vigour, and the flowers increase proportionally both in size and numbers, reaching the great size of 3 or 4 inches across. They appear early in summer and last till late autumn. The plant is admirably adapted for forming margins to beds and borders of shrubs. It extends rapidly, and as it thrives and blooms almost as well in shade as in sunshine, it is fitted also for carpeting or covering under trees and in open woods; and on bald banks and rocks, where a little soil can be placed for it, it may be planted with every assurance of success. It is a naturalised plant in

this country, appearing in most of our floras as indigenous, but originally from southern Europe.

H. Elodes (*Marsh St John's-wort*).—This is a low creeping plant with diffuse stems, rooting at the base, but attaining a height of 6 or 9 inches before flowering. The leaves are woolly on both sides, roundish or kidney-shaped, and the flowers appear in cymes at the ends of the stems and branches, and are pale yellow. The species is found in boggy places in nature, and is useful for adorning wet banks. Flowers early and late in summer. It is indigenous, being abundant in the west of England and Wales and Ireland.

H. humifusum (*Trailing St John's-wort*).—This is a prostrate trailing plant, with freely-branching stems forming dense tufts about 6 inches high. The leaves are small, stalkless, oblong. The flowers, in terminal rather leafy panicles, pale yellow, appear from early summer till late autumn. To those who are acquainted with this little plant only as it appears in nature, the improvement in its appearance when under cultivation in good garden-soil will appear very marked. It is well worth a place in any collection, either as a rock or border plant. It is not uncommon in England and Ireland, but rare in Scotland, and affects a variety of very different habitats, from dry stony pastures to moist bogs.

H. linariifolium (*Flax-leaved St John's-wort*).—This is a pretty and distinct species. It grows rather erect, about 9 inches high, the stems rather thickly clothed with narrow oblong leaves. The flowers, in loose corymbs, are bright yellow, appear in June, and last throughout the summer. Adapted either to culture on rockwork or the front lines of mixed borders. A very rare native of Britain, being found only in one or two stations in South Wales.

H. nummularium (*Money-leaved St John's-wort*).—This is a dwarf creeping species, forming considerable tufted masses; the leaves are round or kidney-shaped. The flowers appear in summer, and last a month or two; they are bright yellow. Adapted for rockwork, the margins of shrubberies, and front lines of mixed borders.

H. patulum (*Spreading St John's-wort*).—This is a densely-spreading plant, between shrubby and herbaceous, with branching purplish stems about a foot in height, clothed with ovate lanceolate almost stalkless leaves, and bearing terminal cymes of yellow flowers, which appear in summer. Best adapted for naturalising, but suitable also for margins of shrubberies and rough rockwork. Native of Nepal.

H. perforatum (*Common St John's-wort*).—This is one of the

commonest of our British species, but not one of the least elegant and showy. It grows erect about 18 inches high, and forms leafy masses below, with numerous barren prostrate stems. The leaves are oblong, stalkless. The flowers appear in terminal corymbs in early summer, lasting till autumn, are bright yellow, the margins of the petals being marked with black dots. The plant is only suitable for rougher purposes, such as forming masses in woods.

In addition to these I would notice an elegant and distinct species from Spain, not now, I believe, in cultivation, but well worth looking after for rockwork. It is *H. ericoides*, a dwarf, somewhat diffuse shrub, with small glaucous heath-like leaves and graceful panicles of lively yellow flowers, small but numerous.

GERANIACEÆ.

A natural order, limited in genera, but very numerous in species. Nearly all the genera are well known in gardens, and, with the exception of *Erodium*, all are distinguished by the brilliancy and profusion of their flowers. *Geranium* and *Erodium* are, however, the only two that comprise species sufficiently hardy to live the year round in the open air in Britain. In *Geranium* we will find some handsome and showy plants adapted alike well to the border or rockwork, but such *Erodiums* as we have in cultivation do not rank high as ornamental plants; they are, however, interesting to those with botanical tastes, and therefore it will be proper to select such as will best illustrate the peculiar features of the family, and for that purpose very few will be required. It may not be amiss here to remark that the popular name *Geranium*, given to the various classes of *Pelargonium* grown so extensively for bedding and exhibition purposes, is erroneous; the two genera are quite distinct, and the most apparent distinction is, that while *Geranium* has regular flowers—that is, the five petals, equal in size and in no way oblique to the stalk—those of *Pelargonium* are unequal in size, and stand more or less oblique or eccentric.

Geranium (*Cranesbill*).—These are plants of easy culture, having no very strong preference for any particular soil, but are least troublesome and flower best in that which is light, rich, and moderately dry. They are kept in best dress by being occasionally lifted, trimmed, and replanted, and if returned to the same place, should be treated to a little fresh soil.

Propagate by division and seed, the former in early autumn, the latter in spring, in a cold frame or warm spot out of doors.

G. argenteum (*Silvery Cranesbill*).—A very dwarf plant, forming compact silvery tufts of 7-lobed leaves, the lobes deeply toothed. The flowers are borne on stalks 3 to 6 inches high, two or three together, are comparatively large, and delicate rose-colour. It forms an interesting and pretty ornament of rockwork in sunny positions, and is hardy enough for culture in most parts of the country; liable, however, to perish under prolonged damp in winter. Flowers in early summer, continuing for a couple of months. Native of the Pyrenees and other parts of southern Europe.

G. cinereum (*Ash-grey Cranesbill*).—This species grows about 6 inches high, and resembles the last somewhat in habit, but is a larger plant, has the leaves not so deeply lobed, and the pubescent covering is not so silvery. The flowers, a few together on a stalk, but freely produced, are pale pink, the petals finely penciled with deeper red. Flowers in summer pretty continuously for a month or two; suitable for rockwork or mixed border in well-drained soil. Native of the Pyrenees.

G. pratense (*Crowfoot-leaved Cranesbill*).—This is an indigenous plant, found in many localities of England and Scotland. It grows rather erect, about 18 inches high, with downy stems and leaves. The leaves are deeply cut into seven acute segments, which are again cut and toothed. The flowers are borne in loose few-flowered panicles, on rather long stalks at the tops of the stems; they are deep blue or purplish blue, and appear in May, June, and July. This is a handsome plant, well deserving a place in even select borders, especially in the shape of its double and white-flowered varieties. Accommodates itself to any ordinarily dry garden-soil.

G. sanguineum (*Bloody Cranesbill*).—This is another native of Britain. It grows 1 foot or more high, with spreading, almost trailing, and much-intertwined stems, forming in well-developed plants finely-rounded masses about 2 feet wide. The leaves are roundish or kidney-shaped, much and deeply divided. The flowers grow singly on long slender stalks, are large, dark red or purple, and appear in greater or less profusion throughout summer and autumn. The plant is handsome, and is a good ornament for second or third lines in mixed borders, and along with the last would form excellent clothing for dry bare banks. The variety *G. s. lancastricense*, which is published in some floras as a species under that name, is even more handsome than the type, being more compact, and the flowers rose or flesh coloured. In nature it appears to be

confined to the Isle of Walney in Lancashire, and succeeds best in light, well-drained, but rich soil.

G. striatum (*Striped Cranesbill*).—For mixed borders this is perhaps the handsomest of the Cranesbills that are in cultivation; and it is, at the same time, one of the most commonly cultivated. The plant is dwarf and compact, rounded in outline, about a foot high. The leaves are bright lively green, those of the roots divided into five-toothed lobes, and those of the stems are three-lobed and toothed. The flowers are white, veined with delicate lines of rosy red, and are borne, two or three together, on a stalk; they appear in greater or less profusion from early summer till late autumn. Native of Italy and other south European countries.

Erodium (*Heron's-bill*).—The same culture is required in the case of the present genus as that advised for the last. The first species is easily managed in the open border in most parts of the country, the other is best adapted for rockwork everywhere.

E. Manescavi.—This is one of the largest-growing species, reaching the height of about 1 foot. The leaves are pinnately divided. The flowers are borne, umbel fashion, at the top of stout stems; are rather large, and pale purple, and appear in early summer. Native of the Pyrenees.

E. Reichardi.—This is quite a contrast to the last, being a low prostrate plant, a few inches high. The very numerous small leaves, roundish in form, are undivided, but bluntly toothed on the margin. The flowers are pure white, solitary on their stalks, and appear continuously from spring till autumn. Native of Minorca.

TROPÆOLACEÆ.

We are all very familiarly acquainted with the various annual and hybrid representatives of this order, which are so worthily popular in the gardens of rich and poor; but of the hardy perennial species of *Tropæolum* we see and know very little indeed. There are several species reputed hardy, but I can only speak of them from hearsay observations, and dare hardly recommend them for culture in the open air in all parts of the country. I have seen *T. tuberosum* and *T. polyphyllum* tried in the north of Scotland, in warm borders under walls, with no very encouraging results. They did not appear to succumb to cold directly, but became a prey to many of the ills that attend

on debility, from whatever cause—and the cause may have been cold—and ultimately perished. These are, however, interesting and ornamental plants where they do well, and should be tried freely in the more favourable parts of England and Ireland in a variety of positions, till such time as experience may accumulate and decide what is best for them; and the same has to be said for *T. edule*. They are tuberous-rooted plants, some with bulky, short, or round tubers; others with thick, widely-extending, succulent roots, whence spring the wiry climbing stems in all directions. They are all easily propagated by means of these roots, and by seed sown in pots in a mild hot-bed in spring. They are all natives of South America, inhabiting chiefly moist shady places at greater or less elevation above the sea.

T. edule (*Edible-rooted T.*)—This species climbs a height of 6 or more feet, with weak tortuous stems, clothed with milky-green leaves, composed of five to seven narrow lance-shaped leaflets. The flowers are solitary, one in each axil, deep yellow or orange. It sometimes bears the syn. *polyphyllum*, to which, however, it has no claim, and is easily distinguished at a glance from that species by its deeper-cut and more widely-spreading leaflets, and its weaker and more tortuous-climbing stems. Native of Chili; flowering in summer; and should be tried in sheltered warm places, in deep rich loam, with the protection of litter fern or coal-ashes over the roots in winter.

T. polyphyllum (*Many-leaved T.*)—With the same colour of flowers, this has different leaves from the last, and a sturdier and shorter growth. The leaves are divided variously, but generally the leaflets amount to ten in number, with the edges quite close or overlapping each other, and they are deeply glaucous. Perhaps from its trailing mode of growth it is better adapted for culture on rockwork than against walls or other supports. Native of Bolivia.

T. speciosum.—This beautiful hardy herbaceous climber is of comparatively recent introduction, having been brought to this country from New Grenada about 1846; and notwithstanding its rare grace and beauty, it is not yet very generally cultivated in private gardens. Only within the past few years have its fine qualities been recognised, and a demand sprung up for it among amateurs; while professional gardeners are even yet tardy in giving their recognition of its merits. A plant such as this, it might be thought, with flowers of brilliant scarlet, and foliage and habit of growth most graceful, and withal hardy, would not be long in winning many admirers; and if some easy and quick mode of developing its beauty

were hit upon, no doubt its admirers would be numerous. But, as a rule, the plant does not establish itself readily in any place, no matter how favourable it may be to its healthy existence: it flowers little, if at all, the first, and not much the second, year after planting; but from the third or fourth year onwards there is a rich reward for the exercise of patience and care. Such tardy progress is scarcely tolerable in this railroad age. There must be very little waiting for results, and only a short step must bridge our efforts and the effects in the flower-garden, or we impatiently discard the materials as unfit. Unfortunately, therefore, for the universal popularity of this charming plant, it will not be coaxed into early effectiveness; yet many, when it becomes better known, will be pleased to wait a little for such a treat as it ultimately affords. Another hindrance to its becoming universally cultivated lies in its being fastidious—almost capricious, indeed—as to soil and situation. It reaches its greatest strength and beauty in a rich, moist, deep soil, and in partial shade; but while I have seen it yielding all its beauty in the north of Scotland, planted in thin soil and clambering over a bald granite rock rising a few feet out of the soil, and in the same neighbourhood luxuriating on one of the finest but most wind-raked terraces in the country, I have also seen it in the south of England refuse to grow in nearly every kind of soil and degree of aspect, even with all conceivable coaxings. This is probably owing to climate. It is very impatient of atmospheric drought, as well as at the roots; and the absence of the long bracing nights and refreshing dews of the north is perhaps the cause of the ill-success of the endeavours I have seen made at cultivating it in the south. In planting, the roots should be put 6 or 7 inches into the soil, and the planting is best done in February or March; the surface should then be mulched with good old manure, and there should be twigs or some kind of support inserted into the soil for the growths to cling to as soon as they appear above ground. This is of much importance, as it enables the plant to establish itself earlier than it would otherwise do.

OXALIDEÆ.

The only genus we will have occasion to notice here in this order is *Oxalis*. It is numerous in species, many of which are highly ornamental, but very few have any claim to be considered hardy, except in the most favourable circumstances in the mild-

est localities of England and Ireland. There are two indigenous species, *O. acetosella* and *O. corniculata*, the former abundant in most localities in woods and moist shady places; the other is not so common, being confined to a few places in the south of England; but from our experience of it in gardens in the shape of the variety named *O. c. rubra*, so much used in bedding-out, there is every reason to believe that it would establish itself anywhere in light rich soil if once sown or planted out. In many gardens it is troublesome after the first year. It seeds abundantly, and germinates in spring and all through the summer like the hardiest weed. In warmer climates it is perennial; but in view of its self-rearing habit, although it is annual in this country, there is no reason to doubt but that it would be equally luxuriant and abundant with our indigenous perennial Woodsorrel if turned out into warm banks and less shady positions than that species naturally affects. Of the perennial exotic species we have not many in cultivation, which is somewhat strange when the elegance of foliage and pretty and profuse flowering qualities of many of them are considered. It is not owing to any difficulty that exists in cultivating them, unless it be in the absence of difficulty, for there is no class of plants more simple in their cultural requirements. Of course I am referring to their culture in pots, and in that way their neat and compact growth, and their habit of free and continuous flowering, along with the fact that, by a judicious selection of species, they may be had in bloom the year round in such humble glass structures as are generally possessed by amateurs, commend them strongly to that class of cultivators; and the autumn and spring flowering species would be found most useful in gardens of greater pretensions, especially where much room and table decoration had to be supplied in winter. But this is a digression; and to return to such as may be cultivated in the open air. It has already been stated that these are few—at least our experience has not revealed many that may be safely left out all the year round. But in mild localities, where there are borders alongside walls or around hothouses, the following species have done well and proved attractive objects; and no doubt others equally ornamental would adapt themselves to such circumstances freely enough, while one or two of the selection will be found hardy enough to succeed on rockwork in sheltered sunny situations in less favourable localities. They all delight in a free porous rich loam, dry rather than otherwise, and are propagated by means of the natural increase of tubers or bulbs, by seed, and, in the case of those furnishing stems, by cuttings also.

Oxalis Bowiei (*Bowie's Wood-Sorrel*).—This is a robust-growing species, forming bold masses of leaves 6 to 9 inches high. The flowers are dark rose, in umbels, appearing in relief of the foliage. It appears continuously throughout the summer, suitable only for warm borders in the south of England and Ireland. Native of the Cape of Good Hope.

O. Deppei (*Deppe's Wood-Sorrel*).—This species grows about 6 inches high; the leaves are divided into four large obcordate leaflets; the flowers, numerous in umbels, are dark lurid red, appearing early, and continuing late in summer, under the same circumstances as the last. Native of Mexico.

O. floribunda (*Many-flowered Wood-Sorrel*).—This is perhaps the best known of the hardier perennial species. It grows from 6 to 9 inches high, producing abundance of foliage, the leaflets, three in number, being broadly egg-shaped, and deeply notched at the top. The flowers are rose-coloured, in many-flowered umbels, and appear in early summer and continue late. Native of Brazil.

O. lasiandra (*Woolly-stamened Wood-Sorrel*).—This is one of the most distinct and beautiful, producing very large dark-green leaves, divided into about seven oblong leaflets, widening somewhat upwards, and producing umbels of very numerous flowers of a bright rose-colour. Flowers in early summer. Native of Mexico, and adapted to culture on warm rockwork.

O. violacea (*Purplish Wood-Sorrel*).—This species grows about 6 inches high; the leaves are divided into three obcordate leaflets; the flowers, in few-flowered umbels, appear in early summer, and are rosy purple. Native of N. America, and more hardy perhaps than either of the foregoing.

RUTACEÆ.

There are many beautiful shrubs comprised in this family adapted for culture in greenhouses, but there is only one herbaceous genus, so far as I am aware, that yields anything sufficiently ornamental for the hardy flower-garden. *Dictamnus*, popularly known as *Fraxinella*, is that genus, and it is not uncommon in old-fashioned and cottage gardens, but not nearly so frequent as it ought to be, considering its beauty and the fine balsamic odour it gives out when rubbed or pressed. It appears in gardens in two distinct colours—one red, the other white; and they are distinguished as species, but are the same

in all essential points, although available for the production of distinct effects in gardens. The white variety appears to be the normal condition of the species, but as the two sorts vary in nothing else but colour, the description of the one will apply to the other in all except the point of colour.

Dictamnus albus.—The stems rise stout and erect about 2 feet high; the leaves are pinnate, with small oval leaflets clothing the stems from the root upwards to the base of the raceme or spike of pretty creamy-white flowers, or in the case of the red variety, dark coral red. It succeeds best in rich, deep, but dry loam, and is a very handsome border plant. Propagate by division or seed. Flowers in early spring. Native of many parts of southern Europe.

LEGUMINOSÆ (PEA-FLOWERS).

This is a very extensive family, being, after *Compositæ*, the most numerous group of flowering-plants; and they are abundantly spread over the whole world. It comprises many beautiful subjects; but unfortunately for our purpose the most brilliant are natives of the tropics, and consequently unavailable for adorning our gardens in the open air—a fact, however, the less to be regretted when we compare the duration of the flowers of the gorgeous tropical species with that of those of temperate and northern climes. Many of them burst, meteor-like, and are gone; but our less gorgeous hardy ones last in many cases for months on end. *Lathyrus*, *Lupinus*, and *Orobus* are perhaps the most showy genera, taken all in all, among the hardy ones; but in most of those that comprise perennial species we will find pickings worthy of selection, and more extended use in flower-gardens than they are at present favoured with.

Anthyllis (*Kidney Vetch*).—This genus contains few species. They bear some superficial resemblance to *Astragalus*, and in cultivation require the same treatment; botanically, however, they are very distinct. In these the inflorescence is usually capitate, rarely spicate, or racemose; and under the heads of flowers there is a more or less conspicuous leafy bract. Besides the very few herbaceous species, there are several low-growing shrubs, such as *A. barba-jovis* and *A. cytisoides*, adapted for culture in favoured localities in Britain, on the coasts, on rockwork, or in collections of dwarf shrubs; and they are pretty and interesting, but not fit to associate with hardy herbaceous plants. The genus is mainly European.

A. montana (*Mountain Kidney Vetch*) is about 6 inches high, of trailing but compact and somewhat tufted habit, with fine pinnate hairy leaves and dense heads of pink flowers, which appear in May and throughout June and July. It is a very choice little rockery plant. There is a white-flowered variety very desirable but rare. Native of the south of Europe, chiefly the Alps and Apennines.

A. vulneraria.—This is our native *Woundwort*, and is an excellent type of the genus. Like the preceding, it is prostrate in growth and trailing, and is usually densely clothed with soft silky hairs. It is rather variable in the colour of its flowers, varying in different individuals from pale yellow to red; and occasionally in the same individual these variations are noticeable. There is a permanent variety with creamy-white flowers, and another with dark-red flowers, which are desirable but rare.

The two forms seen sometimes in Continental catalogues under the names *A. Dillenii* and *A. polyphylla*, if not mere varieties, are too much like the last in appearance to merit a place in any but botanical collections; and it may be thought by many whose acquaintance of *vulneraria* has been made in its native haunts that the same remark applies to it; but it improves much in cultivation, and is well worth a place where the collection is extensive.

Astragalus (*Milk-Vetch*).—This group of Pea-flowers is a most numerous one, comprising as it does upwards of a hundred species, and its geographical range is very extensive—almost universal. The species are spread in greater or less abundance over the central and northern parts of Europe and western Asia, and in the rocky hot districts of the region of the Mediterranean they are abundant, while across the Atlantic they are distributed from the southern slopes of the Andes throughout the country northwards, and advance far into the arctic regions. The value of the family for the purposes of decoration is, considering the large number of species, not high. A very large proportion of the species are alpine plants, pretty in many cases, but generally more curious than pretty, which, under ordinary out-of-doors cultivation, prove in many places unmanageable. A few are remarkable for singularity of appearance. Of these the most notable is *A. tragacantha*, the petioles or leaf-stalks of which are persistent, and adhere to the branches long after the leaves have fallen, and become hard and spine-like; and as they are numerous, dense, and long, the plant has a rather forbidding, touch-me-not look about it. The more ornamental sorts may be cultivated either on the rock-

work or in the open border. They succeed best in light rich loam, but thrive well in most garden-soils, unless exceedingly stiff and wet. None of them like frequent removals, and when doing well they should not be frequently disturbed. Propagate by division, by cuttings when they can be got, and by seed; but division is in some cases not a very safe process; therefore, if cuttings cannot be had, seed should be preferred, and they are produced in such abundance usually as to meet any ordinary demand of increase.

A. alpinus, syn. **Phaca alpina** (*Alpine Milk-Vetch*).—This is a very distinct species. It is prostrate, with branching stems clothed with pinnate hairy leaves; the flowers, in short dense racemes, on which they droop from apex to base, are bluish purple, sometimes tipped with white, and appear throughout the summer. It is decidedly an alpine plant, and thrives best on rockwork in cultivation. It is a native of North Britain, but rare, being found only on the Clova and Braemar mountains, but it is more common on the mountains of central and northern Europe and western Asia.

A. hypoglottis (*Purple Milk-Vetch*).—This is a very dwarf prostrate plant, with slightly-spreading stems clothed with pinnate leaves somewhat hairy. The flowers are pale or bluish purple, in short head-like spikes on slender prostrate footstalks, and appear in summer. It succeeds best on rockwork, but in dry light soil it may also be cultivated in the mixed border where the drainage is good. Native of Europe, Asia, and North America. There is a white variety well worthy of a place as a companion and contrast to the species.

A. leontinus (*Lion's-tail Milk-Vetch*).—This is somewhat more luxuriant and robust in growth than the last, but still prostrate. The leaves are of the same character, but more hairy. The flowers are cream-coloured, in dense prostrate spikes. They appear in May and June. It succeeds in any tolerably sunny position in the border or rockwork. Native of the Alps of Austria.

A. monspessulanus (*Montpelier Milk-Vetch*).—This is perhaps the most ornamental of all the Milk-Vetches we have in cultivation. It rarely rises more than 9 inches above ground, and it presents a very neat dressy appearance throughout the summer. The branches are almost prostrate at the base, and are clothed with handsome, hairy, pinnate leaves. The flowers, in dense prostrate racemes, are bright reddish purple, and appear in June, July, and August. It is a choice plant, and succeeds well in either border or rockwork, and there is an important white-flowered variety. Native of central and southern Europe.

A. Onobrychis (*Purple-spiked Milk-Vetch*).—This is a taller and more elegant plant than either of the preceding, reaching the height of a foot or 18 inches. The flowers are purple, in dense spikes, and are produced in June, July, and August. It is very suitable for the mixed border, and is also desirable for the rock-work. Native of Austria and near Provence.

A. purpureus (*Purple-headed Milk-Vetch*).—This species is nearly related to *leontinus*, but differs from it mainly so far as our object is concerned in the colour of the flowers, which are bright purple, and from *Onobrychis*, to which also it is related, in the form of the heads of flowers, which are in close globose heads, not spikes. Native of the Alps of Provence, Nice, and the south Tyrol. Flowers in June, July, and August, and suitable alike for the border and rockwork.

Baptisia.—This is a genus of North American hardy perennials, comprising few species, and of which only two or three are in cultivation; but as they are in very close resemblance to each other, it is the less to be regretted that we have only few to commend. They are plants of most easy culture, thriving in any soil if moderately well drained. They are easily propagated by division and by seed, which they ripen freely in this country. They are only suitable for culture in the mixed border, being rather too gross in habit for the rockwork; and they might be used on sunny banks in half-kept parts of parks and grounds, and on the margins of shrubberies where rabbits do not abound.

B. alba (*White B.*).—This plant grows erect about 2 or 2½ feet high. The leaves clothe the stems rather densely, are dark green and trifoliate; the leaflets are oval. The flowers are white, appearing in small but numerous racemes on the upper parts of the stems. They appear in summer, and last about two months.

B. australis (*Blue B.*).—This is very near in character to the last. The height and habit are the same. The leaflets are, however, lance-shaped; and the more important floricultural distinction of blue flowers renders this at once desirable as a companion to the other, especially as they flower, and the flowers endure, about the same time.

B. tinctoria (*Dyer's B.*).—This is very distinct from the others, being more dwarf and slender. The leaves are also trifoliate, but the leaflets are roundish, and clothe the stems more sparingly. The flowers are yellow, in small loose racemes at the tops of the stems, and appear about the same time as the others, but last fully a month longer. Height about 1½ foot.

Coronilla.—This is a small family, containing a few species

of considerable beauty. The genus is chiefly European. Two species, *C. cretica* with scarlet flowers, and *C. securidaca*—now known as *Securigera coronilla*—with yellow flowers, are old-fashioned but pretty hardy annuals; seven or eight are dwarf, handsome, hardy, or half-hardy shrubs, and the remainder are ornamental herbaceous plants with somewhat woody stems and very generally procumbent or trailing habit of growth; in some species also evergreen. As a rule they object to being moved about: when well established they should be left undisturbed, unless necessity steps in and orders it otherwise. They prefer a light, dry, rather sandy loam. They may be increased by division, cuttings, and seed—the former method is best done early in spring, before growth commences; the cuttings should be taken before the shoots harden too much or run too much to flower, and be inserted in sand and loam on a spent hotbed or in a cold frame; the seed is best sown in slight heat in March, transplanting and hardening off as early as possible.

C. iberica (*Iberian C.*)—This species grows 6 or 8 inches high, with procumbent almost trailing stems, woody below, but herbaceous above. The leaves are pinnate, with nine bluntly-obcordate leaflets. The flowers are yellow, produced in small but numerous compact heads, and appear in July and August. Native of Iberia. Best adapted for culture on rockwork.

C. minima (*the smallest C.*)—This is a very diminutive but ornamental species. The stems are prostrate and evergreen; the leaves are pinnate, with nine milky-green egg-shaped leaflets. The flowers are yellow, in small but numerous heads, and appear in June, lasting for about two months. It is a choice little plant, beautiful for either rockwork or border where the soil is light, dry, and moderately rich. Native of various countries of Europe, chiefly the south, where it inhabits upland pastures and dry rocky places on the mountains.

C. montana (*Mountain C.*)—This is more distinctly herbaceous than the two foregoing species, and a contrast to both in its style of growth. It rises rather erect, with unbranching stems. The leaves are composed of about seven egg-shaped milky-green leaflets. The flowers are yellow, in close umbellate heads, appearing in June, and lasting a few weeks. Best adapted, from its luxuriant growth, to culture in the mixed border, and accommodates itself to any kind of soil, if not very wet. Height about $1\frac{1}{2}$ foot. Native of eastern Germany, Jura Mountains.

C. varia (*Variable C.*)—This is the finest of the hardy herbaceous sorts, and is a charming plant, of prostrate, almost creeping, habit of growth. It reaches the height of about a

foot, and blossoms most profusely throughout the months of July, August, September, and October, and often also into November, if the situation is a warm one, or the weather mild. The flowers are borne on slender footstalks in heads, and are pink in varying shades, often almost white. The rockwork and mixed border are its most suitable positions, but it is not unaccommodating, and adapts itself to any situation readily enough, provided the soil is not very adhesive and moist.

C. varia, var. **compacta**.—This variety differs from the species only in having, as the name implies, a more compact and restricted habit of growth, a quality which will perhaps recommend it for special purposes, and on that account it is noticed here along with the species.

Galega (*Goat's-Rue*).—This is a genus of rather straggling habit, but yielding beautiful flowers. They are all of rather large growth, and are therefore not well suited for culture in narrow borders, or where space is limited; in fact, they may not be admissible into choice collections, yet their beautiful racemes of flowers and remarkable continuity of bloom render them among the most useful of hardy plants, especially where large quantities of cut flowers are required. They are of easy culture, thriving in most soils if well drained, and they prefer sunny positions. Propagate by division in autumn or spring, and by seed sown in a cold frame in spring. They all require early attention in the matter of support, else they break down and become irrecoverably disfigured for the season.

G. biloba (*Two-lobed Goat's-Rue*).—This species grows about 3 feet high, with weak flexible stems, clothed with long pinnate leaves, the leaflets of which are somewhat downy, and slightly two-lobed at the apex, the midrib being prolonged beyond the lobes into a sharp point. Flowers somewhat variable in colour, but usually pale purple, produced in long rather loose racemes. Appearing in June and throughout summer and autumn.

G. officinalis (*Officinal Goat's-Rue*).—This is even a taller species than the last, but with the same weakly stems, which are clothed with light-green pinnate leaves, the leaflets being acutely lanceolate. The flowers are blue, appearing in handsome racemes from early summer throughout till autumn. There is a white variety, *G. o.* var. *alba*, which would be useful along with the blue where space can be afforded for both. Native of the south of Europe.

G. persica (*Persian Goat's-Rue*).—This is dwarfer by a foot than either of the preceding, but, excepting in so far as lower stature may be considered an improvement, the habit is very much the same. The leaflets are oblong, egg-shaped, with an

abrupt sharp point, and somewhat milky green. The flowers are produced in long compact racemes from June to September. They are white. Native of Persia.

Genista.—There are no truly herbaceous plants in this genus, but there are several handsome low-growing shrubs which may properly be associated with them in adorning rock-work, mixed borders, the margins of shrubberies, and for planting in semi-wild places, where the effects of the common Whin and Broom are desired along with a neater and dwarfer habit of growth. It is rather a large genus, but the limits of the species are not very well defined; in many cases there is a strong tendency to variation, out of which some not very distinct species and a good deal of synonymy have been manufactured by Continental botanists. We have only two or three species in cultivation besides the three that are indigenous; but there ought to be more, if not for the sake of colour—for that is the same throughout the whole group, and is yellow in deeper or lighter shade—at least for the sake of variety of aspect and habit, and in these respects there is considerable diversity. They are plants of easy culture, growing freely in any ordinary soil. They may be propagated by seed, layers, and cuttings; the layers in spring or autumn, the cuttings as soon as the summer growth is becoming firm, and the seed in pots in frames in early spring, or in the open ground.

G. procumbens, syn. **G. prostrata** (*Prostrate G.*)—This species is of trailing spreading habit, rarely exceeding 9 inches high, the stems branching freely, the branches round and green. The leaves are bluntly lance-shaped, and clothed on the under side with silky hairs. The flowers are produced one in the axil of each leaf at the ends of the branches, forming a slightly-leafy raceme. They appear from June till August. Native of rocky places in Moravia and Lower Austria.

G. radiata, syn. **Spartium radiatum** (*Radiating G.*)—This is a very peculiar and pretty species, growing about 18 inches high, with opposite branches, and trifoliate almost stalkless leaves. The flowers are produced in heads of three or four each, and open in the summer months. Native of the Alps of Provence.

G. sagittalis (*Winged G.*)—This is one of the most handsome of the dwarfish section of the family. It grows in rather prostrate fashion, with many sparsely-branched curiously-winged stems, the wings being dark green and membranous. The racemes of flowers are terminal, and appear in May and June. Abundant in the mountain pastures of many countries of Europe.

G. tinctoria (*Green-Weed*).—This species is a native of Britain, and is a low diffuse plant with stems somewhat prostrate at the base, but afterwards ascending and reaching the height of $1\frac{1}{2}$ foot, branching abundantly, the branches being hard, rigid, and green, and producing many small racemes of gay yellow flowers at their extremities, which appear in the summer months. There is a desirable double-flowered sort, the flowers of which last longer than those of the single one. Besides being indigenous, it is very generally distributed throughout Europe in hilly pastures.

Glycine Apios.—This is, in so far as I am aware, the only representative of this genus in cultivation—that is, of the hardy herbaceous ones—and I am not aware that any other is worthy of cultivation. The beautiful and graceful *Wistaria sinensis*, sometimes, but erroneously, bears the name *Glycine*. This is a bold, climbing, or rather twining tuberous-rooted herbaceous plant, which reaches the height of 8 or 10 feet. The stems produce abundantly handsome pinnate leaves, the leaflets of which are narrow, egg-shaped, and dark green. In the axils along the greater part of the stems the racemes of pink flowers appear from July till September. The plant is too rampant and bulky to be used in any select arrangement of herbaceous plants. It is best fitted for naturalising in semi-wild places, associated with the Hop, Tamus, and suchlike climbing plants, where poles must be provided for them to cling to. Native of North America.

Hedysarum.—There is very little in this extensive family that is fit to associate with ornamental hardy perennial plants. There are many species, but they are mostly of a weedy character; many also are biennial and annual plants; and of perennials, biennials, and annuals, there are many not hardy enough to endure the rigour of our climate, and there are none of these so beautiful as to be worthy of recommendation here for culture in frames or other shelter. The “French Honey-suckle” (*H. coronarium*) is of longer duration than two years in light warm soils; but though a showy enough plant for mixed borders of considerable breadth, it is not to trust to as a perennial of more than a few years’ duration, even in the most favourable circumstances. The best of the perennials with which I am acquainted is *H. obscurum*, which is a dwarf plant with creeping roots and ascending or erect stems, producing pinnate leaves composed of from five to nine pairs of leaflets. The spikes of purplish-blue flowers are produced in the axils of the leaves on short stalks. It produces its flowers in July and August, and is a handsome plant for the mixed border and for

rockwork. It grows freely in any soil, and is easily increased by division in autumn or spring. Height about 9 inches. Native of the Alps of southern Europe in moist upland pastures.

Hippocrepis comosa (*Tufted Horse-Shoe Vetch*).—This is a member of a small family of European plants mostly annual, and is the only perennial in cultivation that is worthy of a place. It is indigenous, but limited in its distribution, being confined to the chalk and limestone districts of England, in which it appears in greater or less profusion, but does not occur in either Scotland or Ireland. It is very near in character to some of the *Coronillas* already described. It is dwarf in stature and diffuse in habit. The leaves are composed of many pairs of oblong or linear leaflets. The flowers are produced in small heads or umbels of six or more blossoms, which are pale yellow, and appear in May and last till August. The plant grows freely in any well-drained soil in the mixed border, but it is more characteristic of rockwork. Increase by division from autumn till early spring.

Lathyrus.—This is one of the most showy and handsome of the hardy herbaceous Pea-flowering genera. It is a numerous group; but the greatest number are annual, among which the Sweet Pea, in its rich variety of colour and its delightful fragrance, is the most popular. But there are several beautiful perennials which are not uncommon in gardens, and which may be strongly recommended for more extended culture, as they are not only very handsome, but may be grown with the greatest ease in any kind of garden-soil, and are adapted for a greater variety of ornamental purposes than many of the more beautiful hardy herbaceous plants. They may be planted against any kind of rustic trellis-work, erected either for the purpose of screening off objectionable objects or for purely ornamental purposes. Arbours may be covered in the same way; and, supported on stakes, they are beautiful objects in the mixed border, if it is large enough properly to admit such bulky plants. They may also be easily naturalised in groves and half-kept parts of pleasure-grounds; and in this way, grouped along with plants of similar habit, such as the Hop, *Glycine*, and *Tamus*, they produce a strikingly characteristic effect. Easily increased by division or by seed, the latter sown where it is to remain permanently.

L. grandiflorus (*Large-flowered Everlasting Pea*).—This species grows from 3 to 5 feet high, with rather rigid but climbing, winged, and angular stems. The leaf-stalks are stout and also winged, supporting two broadly oval leaflets and

a branched tendril. The flowers are on stout stalks, two or three to each stalk, are very large and showy, having the keel and wings dark purple, and the standard large and broad, shaded lighter. They appear from June till August. Native of the south of Europe.

L. latifolius (*Broad-leaved Everlasting Pea*).—This is a distinct and well-marked variety of the *L. sylvestris*, which is regarded by gardeners and by many Continental botanists as a species on its own account, and for ornamental gardening it is quite worthy of the distinction. It grows 6 or more feet high, with weaker stems than the last. The leaf-stalks support two broadly-lanceolate leaflets, and terminate in a branched tendril. The flowers are produced in a loose few-flowered raceme, are purple and pink, of a very showy character, and appear throughout the summer and often far into autumn. There is a handsome white-flowered variety in cultivation which is desirable.

L. mutabilis (*Changeable Everlasting Pea*).—This species grows from 4 to 5 feet high, with stems weak, straggling, and winged. The leaves are composed of several pairs of broadly egg-shaped leaflets which are milky green, and terminate in a simple unbranched tendril. The flowers are produced in loose racemes, changing from purple to purplish red. They appear in June and last till August. Native of Siberia.

L. sylvestris (*Wood Everlasting Pea*).—This has the habit of growth and inflorescence of the last, but the leaves are narrower and longer, and the flowers are less effective, being light purplish red. It is a native of Britain and many parts of the continent of Europe. Height about the same as preceding, and the flowers appear about the same time and last as long.

L. tuberosus (*Tuberous-rooted Everlasting Pea*).—This species grows from 2½ to 4 feet high, with quadrangular stems. The leaf-stalks support two leaflets, and extend into a branched tendril. The flowers are in short few-flowered racemes on long stalks, and are red or purplish red, and appear in July and August. Native of Holland.

Lotus corniculatus (*Bird's-foot Trefoil*).—There is not much besides this species that is really hardy, ornamental, and perennial in this not very extensive group of plants; and this plant, so common in all parts of Britain, is only recommended here for planting on extensive rockeries where there is room and some desire for large and varied collections. Under cultivation, the lively showy aspect which the plant bears in nature improves much in cultivation, and it would not lose much by

comparison with many farther-fetched things. The dwarf diffuse sort is the one here recommended—it is the most beautiful both in habit and flowers; and there is a double-flowered variety, which, inasmuch as it is more continuous and sustained in bloom, is more desirable than the type. It is a very variable plant in nature: in many districts of very limited extent, much variation of character may be observed; and so-called species not a few, both in Britain and on the Continent, have been created out of the more marked variations that have received the attention of botanists from time to time. The plant is prostrate and diffuse, rarely reaching more than 9 inches high, but extending a foot or more wide. The stems are abundantly clothed with dark-green trifoliate leaves, the leaflets egg-shaped, but somewhat variable in size. The flowers are borne in small compact umbels, of from six to twelve blossoms, bright yellow, and the standard or broad upper petal tinged with bright orange-red externally. The more distinct of the varieties above alluded to, and which pass as species, are *L. major*, which grows taller and more erect than the type, and is more luxuriant every way, but not so floriferous; *L. hirsutus* is in all respects like the type, but is rather densely hairy, and is inferior as regards flowering qualities; and *L. tenuis*, more weak in all its parts, and quite unworthy of cultivation. There are some half-hardy species, such as the old-fashioned and once favourite *L. jacobæus*, which would be found very useful for introducing variety and contrast into mixed borders; and they are so easily kept up in stock by cuttings where ordinary facilities for that purpose exist, that they give no more trouble than Verbenas and other bedding plants, and they yield quite as uninterrupted a succession of bloom. The Bird's-foot Trefoil succeeds in any common garden-soil, and blooms throughout the greater part of summer early and late.

Lupinus (*Lupine*).—This is a noble genus, comprising many species, annual, biennial, and perennial in duration, which are represented in a very limited way in private gardens by a few varieties of *L. polyphyllus*, a perennial species, and by the common dwarf annual Lupine, *L. nanus*. Other perennial species are rarely seen out of botanic gardens, which, considering the fine handsome character of the leaves, and the bold, striking, and gaily-coloured plume-like racemes of flowers that many of them produce, is somewhat wonderful. They are most easy to cultivate, succeeding well in any ordinary garden-soil, but delighting most in that which is deep, rich, and moist. The taller growers are beautiful background plants for wide borders and for the centres of large beds, and they are very useful for introducing

colour into masses of evergreen shrubs, and for naturalising in groves and half-kept places where rabbits do not abound ; but if they are fostered the Lupines have no chance, as they are very fond of them. The dwarf species are available for the same purposes, also, in suitable positions. All are propagated by seed and division, and by cuttings also—the cuttings as early as they can be got in spring, a little hardened at the base, or afterwards from side shoots, inserted in sandy soil under hand-lights in a shady place ; the divisions in early autumn ; and the seed in pots in spring, in cold frames, or in the open ground where they are to remain.

L. leucophyllus (*Hoary-leaved Lupine*).—Plants about $2\frac{1}{2}$ or 3 feet high, erect, the stems clothed with leaves divided into about nine oblong lance-shaped leaflets, which, with the stems, are densely covered with whitish hairs. The flowers appear in August and September in rather lax spikes, and are reddish-purple or pink. Native of Columbia.

L. nootkatensis (*Hairy Lupine*).—Plant taller and more luxuriant than the last, growing 4 to 5 feet high, the stems and leaves hairy, with rather long spreading hairs. The leaves are composed of seven or more lance-shaped leaflets. The spike is loose and the flowers distinctly whorled. They open in June and continue for a couple of months, and are purple. Native of Nootka Sound.

L. perennis (*Smooth Perennial Lupine*).—This species grows from 2 to 4 feet high, with erect stout stems, destitute of hairs. The leaves are divided into six or more leaflets, lance-shaped, but widening towards the point. The raceme is moderately dense and long, and the flowers are arranged alternately or only imperfectly whorled ; they are blue, but varieties with variously-coloured flowers are to be met with. They appear in early summer. Native of North America.

L. polyphyllus (*Many-leaved Lupine*).—This is one of the most striking and handsome of the hardy Lupines. It grows from 4 to 6 feet high, erect, with somewhat hairy stems densely clothed with large handsome leaves. The leaflets are numerous—often as many as fifteen—and lance-shaped. The spikes are long, dense, and numerously flowered, and the flowers are arranged in a somewhat whorled manner. They vary much in colour in different individuals—blue, purplish blue, reddish purple, and white, being the most common shades ; and there are variegated individuals exhibiting different combinations of these colours. Flowers in summer. Native of Columbia.

L. sericeus (*Silky Lupine*).—This is a dwarf plant, growing about 1 foot or 2 feet high. The stems and leaves are clothed

with close-lying silky hairs. The leaves are composed usually of about seven leaflets, sharply lance-shaped. The flowers are purple, whorled in short racemes, appearing in early summer. Native of North America.

Orobis (*Bitter Vetch*).—Modern botanists do not regard this group as anything but an artificial offshoot of the genus *Lathyrus*; but in gardens their distinct habit of growth and style as decorative plants deserve a separate designation. It may be characterised as a very handsome group, if not strikingly showy, and in their flowering period they have few compeers amongst hardy plants; and their value is enhanced when it is remembered that their blossoms appear at a time intermediate between spring and summer flowers, thus filling up a gap that should not, but does, exist in most gardens that are conducted according to the fashion of the present time. Some of them, such as *O. vernus* and *cyaneus*, owing to their neat dressy habit of growth, low stature, and free-flowering quality, are peculiarly fit subjects for the gardens of amateurs and others whose space is limited. All are good rockwork plants where that is on a large scale, and they are among the best of hardy mixed-border plants. They are propagated by seed sown in pots in cold frames in early spring, or later in the open ground where they are to remain, or in a nursing border, from which they must be timeously transplanted; and by division in autumn or spring. Probably other species equally worthy of cultivation are yet to introduce, or have been in gardens and are lost, but the following selection embraces the best that we have at present.

O. cyaneus, *syn. Platystylis cyanea* (*Blue Bitter Vetch*).—This species forms handsome tufts 9 to 12 inches high. The stems are clothed with bright green, narrow, lance-shaped leaflets, two or three pairs to each stalk. The flowers are bright blue, in loose few-flowered racemes; in profusion in May and June. Native of the Caucasus.

O. Fischeri (*Fischer's Bitter Vetch*).—Rather a peculiar and pretty species, producing unbranched stems about 1 foot high, thinly clothed with linear lance-shaped leaflets on very short stalks, only a pair to a leaf. The flowers are produced in one-sided crowded racemes, are purplish, and appear in early summer. Native of Siberia.

O. Jordani (*Jordan's Bitter Vetch*).—This is a pretty species, growing from 9 to 12 inches. The leaves are composed of three or four pairs of broadly lance-shaped leaflets terminating in a distinct sharp point. The flowers are blue, in few-flowered racemes, appearing in early summer. Native of Lucania.

O. luteus (*Yellow Bitter Vetch*).—This is one of the hand-

somest of the group. It grows from 1 to 2 feet high, the stems being crowded with leaves, which are composed of from three to five pairs of leaflets, milky green on the under side. The flowers, produced in rather dense racemes, freely from June till the end of July, are pale yellow. Native of Siberia.

O. niger (*Black Bitter Vetch*).—This is an indigenous species, but rare, though abundant in most countries of central and southern Europe. It grows from 1 foot to 2½ feet high, and at the greater height becomes rather a straggling plant. The leaves are composed of from four to six pairs of oval dark-green leaflets. The flowers, in short loose racemes, are dullish purple. They open in June and July.

O. variegatus (*Variegated Bitter Vetch*).—This is a fine compact species, with erect habit, producing its leaflets in two or three pairs to the stalk; they are egg-shaped, and have three rather conspicuous longitudinal veins. The flowers are beautifully variegated, rose, crimson, and blue, and are produced in dense racemes, which appear in May and June. Height about 1 foot. Native of Italy and its islands.

O. vernus (*Spring Bitter Vetch*).—This species is very near in habit of growth and general aspect to the last, and about the same in height. The leaves are composed of two or three pairs of oval sharply-pointed leaflets, bright green, and distinctly three-veined. The racemes of flowers are loose and rather one-sided, and the flowers are bright reddish purple, and appear in April and May. It is one of the choicest plants of its period. Native of France, Germany, and Italy.

Oxytropis.—This genus is nearly related to *Astragalus*, and resembles, in such species as we have in cultivation, some of the dwarf sorts of that family. It is not a small family, comprising, as it does, twenty or thirty species; but they are not common in gardens, two or three species being the utmost to be met with in even extensive botanical collections. They are not showy plants, but interesting and pretty, and are best adapted for rockwork culture in rather dry sandy soil. They are propagated by division in early autumn, and by seed in spring, in pots or in the open ground.

O. campestris, syn. **Astragalus campestris** (*Field O.*)—This is a very local British plant, being found only on the Clova mountains in Aberdeenshire, but is frequent in upland pastures and gravelly and rocky places in the mountain-ranges of Europe, western Asia, and North America. The plant is dwarf, almost stemless, producing tufts of long pinnate leaves, composed of twenty or thirty lance-shaped leaflets, clothed with long silky hairs. The flower-stalks are about the same length as

the leaves, terminating in short spikes of yellow flowers, shaded slightly with purple. The plant varies somewhat in the colour of the flowers and other minor particulars, and some of the varieties have been set up as species. The more remarkable of these are *O. c.* var. *cærulea*, syn. *O. cærulea*, having blue flowers; and *O. c.* var. *sordida*, syn. *O. sordida*, in which the keel bears a blackish spot, and the standard is more distinctly tinged with purple than the type. Flowers in July and August.

O. montana (*Mountain O.*)—This species is rare in cultivation. Like the last, it is all but stemless. The leaves are composed of twenty or more leaflets, broadly lance-shaped, and clothed with long silky hairs. The heads or short racemes of flowers are borne erect, are purple or pink, and appear about the same time as the last. Native of mountain pastures in Austria and other parts of central Europe.

O. uralensis (*Silky O.*)—This is the handsomest plant of the three. It is very similar in habit and stature to the preceding. The leaflets are broadly lance-shaped and densely clothed with close-lying silky hairs. The racemes are more numerous flowered than either of the other two, and the flowers are bright purple, spreading horizontally from the stalk; they appear in May, and last about two months. Native of the Tyrol, Pyrenees, and Carniola; found also on some of the Scotch mountains.

Phaca (*Bastard Vetch*).—This genus is nearly related to the last and to *Astragalus*, and the species are sometimes in catalogues mixed up together. The species of this are adapted to the same purposes, and require the same treatment, as that described for *Oxytropis* and the smaller *Astragaluses*.

P. astragalina (*Astragalus-like Bastard Vetch*).—This is perhaps the most vigorous of the species selected. The stems are short but branching freely, bent earthwards at first, but rising obliquely afterwards. The leaves are composed of sixteen or more egg-shaped leaflets, clothed above and below with close-lying hairs. The flowers are produced in short loose racemes; the keel deep violet, and the standard paler, or, as the plant is somewhat variable, in some individuals it is white. They appear in June and July. Inhabits upland pastures on the Alps and Pyrenees.

P. australis (*Southern Bastard Vetch*).—This is rather a prostrate species, rarely exceeding 9 inches high, forming tufted masses of branched stems. The leaves are composed of twelve or more narrow lance-shaped leaflets. The flowers are produced in close short racemes; the keel dark blue, the standard white or pale yellow; and appear in June, July, and August. Native

of rough gravelly pastures at high elevations on the Alps and Pyrenees.

P. frigida (*Frigid Bastard Vetch*).—This species produces many unbranched stems, clothed with leaves composed of eight or more leaflets, bluntly egg-shaped, and slightly fringed on the margin with spreading hairs. The flowers are in short racemes, and pale yellow, appearing in July and August. Native of the Alps of Austria.

Sophora.—This group is more remarkable for its handsome trees than for any very valuable hardy herbaceous plants; yet there are a few of these which, though they cannot be commended as select or first-rate ornamental subjects, produce handsome racemes of flowers and fine foliage, and have a certain bold massiveness about them that fits them for some purposes that more showy species would be considered as thrown away in. They are quite worthy of a place in large collections, in borders where ample room may be allowed, and are suitable for furnishing groves and open places about woods with variety of verdure and a little colour; and they may be used also on the margins of shrubberies with good effect. They are propagated by division in autumn, and prefer a rich deep loam, but succeed very well in inferior soils.

S. alopecuroides (*Foxtail S.*)—This species grows from 2 to 3 feet high, with stout erect stems branching freely on the upper part. The leaves are long, pinnate, composed of many oval leaflets, slightly clothed on the upper side with silky hairs, which become more conspicuous as they increase in age. The flowers are in racemes, terminating the stems and branches, and are dull yellow. They appear in summer. Native of the Levant.

S. flavescens (*Yellowish S.*)—This species is scarcely so tall and robust as the last, rarely exceeding 2 feet; but in general habit they have a strong resemblance; the same character of leaves; the leaflets broader for their length, the same terminal racemes of flowers, which are, however, pale yellow or straw-coloured. Native of Siberia. The flowers precede those of the Foxtail S. by about a month.

Thermopsis.—This is a small genus of handsome and interesting plants; only two species, so far as I am aware, are in cultivation, and these are rare, and seldom if at all seen in private collections, and not in many nurseries. They are worthy of more extensive cultivation, being select and rather peculiar in their style—and plants of that character we want more of in all our gardens. They are not so easy to cultivate as many of the hardy herbaceous perennials. The soil they like best is well-

drained rich loam, rather sandy than otherwise ; and they have an antipathy to frequent removals, or disturbings as by deep digging in their immediate neighbourhood. On this account it is not a safe process to attempt increasing them by division ; but as the two species ripen seed more or less freely, there is nothing to regret in that respect, as propagation by seed will be found both more expeditious and safe. The seed should be sown in pots in a cold frame or under a hand-glass in spring.

T. fabacea, syn. **T. rhombifolia** (*Bean-like T.*)—This species grows erect about 18 inches high. The stems are thinly furnished with trifoliate leaves ; the leaflets broadly egg-shaped, and diminishing sharply from the centre to both ends, and clothed underneath with silky hairs. The flowers appear in summer in loose racemes, are bright yellow, and rather large. Native of Kamtschatka.

T. lanceolata (*Sharp-leaved T.*)—This is scarcely so tall as the last. The stems are erect, rarely exceeding 1 foot in height. The leaves are trifoliate, on very short stalks. The leaflets are lance-shaped. The flowers few together, in loose heads, are large, bright yellow, and appear in June and July. Native of Siberia.

ROSACEÆ.

In this large tribe none of the other herbaceous genera can compare in beauty with *Spiræa*. It is the only genus yielding hardy herbs that can come into rivalry with the handsome shrubs for which the order is distinguished, and some of them are among the most beautiful of hardy border-plants. Yet there are other genera quite worthy of cultivation. *Dryas* and *Dalibarda* furnish several pretty rockwork gems, and suitable also for the front lines of mixed borders ; and genera *Potentilla* and *Gillenia* yield some interesting and pretty subjects for the same purposes.

Dalibarda fragarioides, syns. **Waldsteinia fragarioides** and **Comaropsis Doniana** (*Strawberry-like D.*)—This plant is the only ornamental representative of an otherwise weedy genus, and is erroneously circulated under the name *Waldsteinia geoides*. It is a low creeping plant, rooting freely as it extends. The leaves are composed of three coarsely-toothed leaflets. The flowers are bright yellow, three or four together on the

stalks, which are numerous. It grows freely in shade or sunshine, delights in deep loamy soil, and is adapted for either rockwork or front lines of mixed borders. Propagate by division. Flowers in May and June. Native of North America.

Dryas.—This is a genus of dwarf, moderately-spreading plants, with neat evergreen leaves and pretty strawberry-like flowers. They are easy to cultivate, flourishing well in rich light loam well drained, but also well supplied in the growing season with water. They are best adapted for culture on rockwork, but in well-drained light soil succeed well, also in the front of borders on the level, if partially shaded from scorching sun in summer; their shining dark-green leaves appear to be easily burned up in such positions. If the natural soil is retentive and heavy, a little peat and sand added to it will make it more congenial to these plants. Propagate by division in early spring.

D. Drummondii (*Drummond's D.*)—This species is from North America. It grows only 2 or 3 inches high, the stems spreading along the surface of the ground; the leaves are oblong in shape, dark green, and shining on the upper side, and clothed with down beneath. The flowers are borne singly on stalks, 3 or 4 inches long, proceeding from the axils of the leaves, and are pale yellow or sulphur. They appear in summer.

D. octopetala.—This is a native of Britain, and very similar in habit and aspect to the last. The flowers are borne in the same manner, and are creamy white, and appear about the same time. In both species not the least interesting feature appears after flowering; when the heads of fruit are developed, each carpel is surmounted by long feathery tails.

Another form named *integrifolia* is cultivated, but there is nothing horticulturally important about it that is not possessed by the two species described.

Geum (*Avens*).—This genus does not furnish much that is beautiful for the mixed border or rockwork. One species, *chiloense*, is handsome, and continues to keep up a crop of bloom for rather a long period, though it is often towards the end spare enough. The other selected species is dwarf, and best fitted for adorning rockwork, though it is quite admissible in mixed borders, also, in the front. They are easily cultivated, and succeed in any common garden-soil. Propagate by division in autumn or spring.

G. chiloense, syn. **G. coccinea** (*Chile Avens*).—There are two varieties of this species in cultivation—one dark crimson, the other a fine showy scarlet. Both are beautiful when at their best, but the latter is the more effective plant of the two. They

grow about 2 feet high, rather straggling, the stems thinly clothed with leaves. The mass of the leaves are about the base of the stems; they are pinnate, with the terminal lobe larger than the side ones. The flowers are produced in considerable profusion and are large. They appear from June throughout the greater part of the summer. Native of Chili.

G. montanum, syn. **Sieversia montana** (*Mountain Avens*).—This a dwarf tufted plant, with numerous pinnate leaves, the terminal leaflet very large and broad and toothed, the others much smaller and diminishing in size downwards. The flowers are borne one on each stalk, the stalk furnished with a small sharply-toothed leaf or two. They are yellow, and appear from May or June onwards throughout the summer, but never in great profusion. Inhabits mountain pastures on the Alps and Apennines.

Gillenia.—This is a small genus from North America, comprising only two species. They are elegant rather than showy plants, and in respect of ornamental use they are too much alike in appearance to be desirable in one collection, unless it be botanical. They flourish in any ordinary garden-soil, and are propagated by division in autumn or spring.

G. trifoliata (*Three-leaved G.*)—The plant reaches the height of about 2 feet, with erect stems, which branch when near the top into loose panicles of numerous white and red flowers. The leaves are composed of three lance-shaped sharply-toothed leaflets. The flowers appear in summer.

The other species (*G. stipulacea*) has the same habit of growth and the same character of flowers, appearing at the same time.

Potentilla (*Cinquefoil*).—This is a numerous group. Its character for ornament is not very high. Many species are pretty, even gay when at the full flush of their bloom; but that does not last long, though the actual blooming period may be stated as lengthened, as for long after the full bloom is over they continue to yield a thin display, but it does not greatly enliven the general seediness that accumulates as the season moves on. They are, however, quite useful and fit for many purposes, if not altogether what is desirable in the choice mixed border. In extensive rockwork and shrubbery borders, and in many half-kept places about open woods, they will be found useful for covering bald surfaces and throwing in a little colour. They all succeed well in ordinary loamy soil, and are propagated by division in autumn or spring.

P. alba (*White Cinquefoil*).—This is a dwarf species, growing about 6 or 9 inches high, with weak, somewhat trailing

stems. The root-leaves are composed of five stalkless leaflets, somewhat connected at the base, and clothed on the under side with dense silky down. The flowers are pure white, borne at the end of the stems and branches. The plant succeeds well in either shade or sunshine. Native of the Alps and Pyrenees.

P. atrosanguinea (*Blood-red Cinquefoil*).—This is from Nepal. It forms neat rounded masses of leaves, each composed of three leaflets oblong in shape, cut or toothed on the margin, and clothed with white or dull-white down underneath. The flower-stems rise to the height of 1 or 2 feet, rather weak and straggling. The flowers are large deep crimson normally, but variable in colour in different individuals under cultivation, and the plant has given origin to several handsome hybrids. Flowers in May and onwards for a month or two.

P. nepalensis (*Nepal Cinquefoil*).—This, as the name implies, is from the same country as the last. They are nearly related to each other, but quite distinct in effect horticulturally. The leaves are composed of five oblong leaflets sharply toothed on the margin. The flower-stems rise to about the same height as the last, and are also somewhat straggling as the flowering continues. The flowers are scarlet or purplish scarlet, and some fine varieties and hybrids of various shades of red are to be found in gardens.

P. nitida (*Shining Cinquefoil*).—This is a very dwarf species, attaining the height of only 2 or 3 inches. It is an elegant little plant with trifoliate leaves, the leaflets somewhat wedge-shaped, toothed at the top, and covered on both sides with shining silvery hairs. The flowers, one or two together on the stalks, are rather small, but beautiful rose-colour. They appear in June and July. This is a pretty plant for rockwork. It is found at lofty elevations on the Alps of Tyrol, Savoy, and Carniola.

P. pyrenaica (*Pyrenean Cinquefoil*).—This is one of the showiest of the alpine species. The stems are bent downwards at the base, afterwards rising obliquely to the height of about 9 inches. The root-leaves are usually composed of three, but sometimes of five, leaflets. The flowers, several together, are large, with broad bright yellow petals. The plant is adapted for either rockwork or border culture. Flowers in summer. Native of the Pyrenees.

P. rupestris (*Rock Cinquefoil*).—A close compact species growing from 6 to 9 inches high. The root-leaves are pinnate, composed of usually five egg-shaped toothed leaflets. The flowers are large, pure white, in open few-flowered panicles.

They appear in May and June. Native of the mountains of central and southern Europe, and of Britain, but only locally. A pretty species for rockwork or the front of borders.

Spiræa.—This genus is a considerable one, but a large number of the species are shrubs. Of hardy herbaceous plants there are, however, several very beautiful—even splendid; and it may be said of all the species that they are worthy of a place in any garden. They are better fitted from their style of growth for culture in borders or beds than on rockwork, unless it is of great extent, when they may very properly form the centre of groups. The more vigorous species are admirable for introducing into open moist woods, the banks of streams and ponds, and moist glens. All are easily propagated by division.

S. Aruncus (*Goat's-beard S.*)—This is the most vigorous and bulky of the group. It grows erect, with stout stems 4 or more feet high, densely furnished with immense tripinnate leaves. The flowers, in bold yet graceful spikes, are white or creamy white, and appear in June and July. One of the best for naturalising, and for introducing among evergreen shrubs. Native of Siberia.

S. Filipendula (*Dropwort S.*)—This is a British species, and in the double form is not uncommon in gardens. The leaves are dark green, pinnate, the leaflets oblong and deeply cut. The stems are erect, very sparingly furnished with leaves, about 18 inches high, bearing corymbs of beautiful creamy-white flowers often tinged with red. The double variety is the most ornamental. Flowers from early summer till late in autumn in moist good soil.

S. lobata, syn. **S. venusta** (*Lobed-leaved S.*)—This is a very handsome species, not so well known in gardens as the last two and *Ulmaria*. It grows from 1½ to 2 feet high, with some resemblance to the Meadow-Sweet, but it is more nearly related to the next species. The leaves are pinnate, the side leaflets three-lobed, the end one seven-lobed. The flowers are beautiful deep rose, in rather dense panicles at the top of the stem, which partakes of the colour of the flowers to a certain extent downwards. They appear in July and August. Native of Siberia. This is a beautiful and choice plant, not nearly so well known as it ought to be.

S. palmata (*Palmate-leaved S.*)—This beautiful species is one of the finest of hardy herbaceous plants. It is of recent introduction. It is similar in style of leaves, habit, and inflorescence to the last, but is superior to it in effect of colour, which is deep crimson, of which the stems also partake a considerable length downwards. The flowers appear the same time as the last.

S. Ulmaria (*Meadow-sweet S.*)—This is too well known to need description, and too much admired to need praise. The double-flowered form is the best for the garden, and the single for introducing anywhere. There is a beautiful golden variegated sort that is one of the handsomest of hardy variegated herbaceous plants, and is constant in all soils. An abundant native of Britain, and of Europe and Russian Asia, in moist meadows and stream-sides. Blooms in early summer and continues late.

ONAGRACEÆ.

Few natural orders so limited in species comprise so much that is pre-eminently valuable to the flower-gardener as this. The species are not so numerous as in many other orders, but they are very generally beautiful, and fit for a variety of purposes in decoration. *Fuchsia*, one of the most popular of cultivated genera, furnishes the most brilliant example of the ornamental value of the order. *Oenothera* is the most important of the hardy herbaceous genera, some of the species ranking among the most showy of border-plants. *Epilobium* furnishes one or two species of value for certain purposes, and *Gaura* and *Zauschneria* are both limited but handsome groups, combining both grace and colour in the few species they comprise. Excepting *Epilobium*, the other genera mentioned are from America in various latitudes.

Epilobium (*Willow Herb*).—This is an extensive family in species, but is very generally weedy in character. There are two species only with which I am acquainted worthy of any notice here; the one is the French Willow Herb, *E. angustifolium*, and the Great Willow Herb, *E. hirsutum*, both of which are excellent subjects for naturalising in moist places about banks of streams and ponds, or in moist open woods, and the former is valuable also for associating with shrubs.

E. angustifolium (*French Willow Herb*).—This is a handsome plant, having considerable resemblance to a Willow both in habit of growth and foliage. The stems terminate in fine showy spikes of rosy-purple flowers, which last for a couple of months in summer. The plant grows from 2 to 4 or more feet high, and may be considered too gross and encroaching for admission among select herbaceous plants, but there are few places of considerable extent where this and like plants may not be used with propriety and excellent effect, and particularly

so where water enters into the composition of the features of the design. It is very easily increased by division in autumn or spring. There is a handsome white-flowered variety.

E. hirsutum (*Great Willow Herb*).—This, like the last, is indigenous, but they are very distinct from each other in most respects. This is a tall plant, growing 4 or 5 feet high, with very hairy stems, and stalkless broadly-lance-shaped leaves, also hairy. The flowers are large individually, but they are not so effective as those of the last, being produced in leafy terminal racemes. They appear in July and August. There is a handsome variegated form in cultivation, which, along with the species, may be cultivated for the same purposes as the French Willow Herb, but is more fastidious about being accommodated with a moist position. Propagate by division.

Fuchsia.—Although nothing but shrubby plants are comprised in this family, I cannot forbear recommending them for culture in mixed borders along with herbaceous plants, and for mixing with shrubs. There are many parts of the country where Fuchsias of the hardier kinds permanently do well in the open air without any trouble when treated as herbaceous plants, and in very favoured places in England, the south-west of Scotland, and in Ireland, their stems even escape the scath of winter. The old-fashioned and familiar *coccinea* is one of the hardiest, and adapts itself to any locality, requiring only in even the coldest a covering of coal-ashes, or, what is better, but not so tidy in dressed places, an inch or two of stable-litter over the crowns after the stems have been cut down. All the vigorous florists' varieties may be used in the same way, and the variety and grace they would infuse into borders would well reward any little extra attention they would require. I have seen Fuchsias of great bulk, used as single objects on lawns, lifted and stowed away in cool sheds and cellars for the winter, and brought out and started in a late peach-house year after year, and from the end of July till the end of September they were very beautiful. This may not be done in many parts of the country, and is not practicable except in places where ample glass accommodation exists for spring demands; but it may be possible to produce varieties better fitted for this kind of work; indeed it is probable that if the same intelligence and skill had been applied to the production of varieties for out-of-doors ornamentation as has been expended on those for show purposes and pot culture, we should have had many useful and admirable things now. To those having facilities for experiments in that direction I would commend the subject, feeling sure that they will not be without success, if they enter on it

with that energy and skill which is characteristic of the British florist.

Gaura.—This is a limited group, and I am aware of only two perennial species in cultivation. They are plants of elegant habit and pretty flowers. They are easily cultivated, flourishing best in light dry rich soil, and in soils of an opposite character. Careful means should be taken to secure perfect drainage; and a little protection in the shape of coal-ashes over the roots would be a safe measure in the north in extra cold wet places. Propagate by division in spring, and by seed in pots in a cold frame in early spring, when they will flower the first season.

G. coccinea (*Scarlet G.*)—This is a dwarf rather dense-growing plant, reaching the height of 9 or 12 inches. The stems terminate in rather dense short spikes of bright red flowers, which appear in summer and autumn. Native of the Southern States of North America. A handsome ornament for the front of the mixed border and for rockwork.

G. Lindheimeri (*Lindheimer's G.*)—This is a most elegant plant, forming beautiful masses of light flexible stems about 18 inches or 2 feet high. The stems terminate in long open spikes of pink or red and white flowers, produced in July and August, and onwards, in mild seasons and places, till October. Native of Texas.

Oenothera (*Evening Primrose*).—In this genus some of the most showy and ornamental of hardy herbaceous species of plants are comprised, and there are few that may be considered unworthy of cultivation. In habit, stature, and colour there is some similarity, and this consideration limits the selection to a few of the most showy and dissimilar species. Many bloom for a very long time, and have immense flowers of striking and attractive appearance, and are besides very pleasingly fragrant; in fact, they have all the requisites of choice garden-plants, and deserve more attention than is given them. There are a good many annual and biennial species, and a few of the perennials may be treated as either successfully in heavy wet soil and cold localities, where they are often not good perennials, becoming gradually weaker and even dying off after the first year. They flourish best in light, sandy, well-drained, and moderately-rich soil, and prefer a warm sunny exposure. Propagate by division in early spring, and by seed in pots in a slight hotbed in March when to be bloomed the first season, and in July when to be treated as biennials, sheltering the plants under hand-glasses or by any more temporary shelter in winter. In any case from seed the plants must have early attention in the matter of

pricking off into rich light soil in spring, giving them the help of a frame either warm or cold as convenience may allow; but in autumn they may be pricked out on any warm spot in the open air, and merely shaded from the sun till they strike root afresh. They may also, in many cases, be propagated by cuttings in the early part of the season before flowering commences, in the same way as has already been recommended for most herbaceous plants.

Æ. anisoloba (*Unequal-lobed Æ.*)—The plant grows about 2 feet high, and is somewhat downy in most of its parts. The stems are rather erect, branching moderately. The root-leaves are entire or obscurely toothed, those of the stem deeply and coarsely cut and toothed. The flowers are large, white, and produced from June throughout the summer, and often also in autumn. Native of Chili, and good permanent border-plant in warm soil.

Æ. Drummondii (*Drummond's Æ.*)—This in unfavourable soil is best treated as a biennial; but in favourable soil and situation is a good perennial, not at all prone to die away, and is one of the handsomest of the group. The plant is softly downy in stems, branches, and leaves; the latter are broadly lance-shaped, slightly toothed, but undivided. The flowers are large, bright yellow, appearing in June and continuing for a month or two. Native of Texas.

Æ. Fraseri (*Fraser's Æ.*)—The plant grows erect, about 2 or 2½ feet high, the stems branching in the upper part. Leaves longish oval, dark green, abundantly clothing the stems and branches. Flowers yellow, very numerous, forming dense leafy racemes in the upper part of stems and branches. Flowers in early summer, continuing till late autumn. Native of North America, and one of the hardiest of the group.

Æ. macrocarpa, syn. **Æ. missouriensis** (*Large Æ.*)—This is perhaps the most showy of the group. The plant produces many prostrate stems, branching freely. The leaves are large, broadly lance-shaped. The flowers are very large, several inches across, and bright yellow, appearing throughout summer. Although a prostrate plant it is very luxuriant in warm sunny aspects and light rich soil, but does not endure for long in unfavourable soil, and is better, therefore, treated as an annual or biennial in these circumstances. Native of Missouri.

Æ. marginata (*Large White Evening Primrose*).—This species grows about 9 inches high. The leaves are irregularly pinnatifid. The flowers are very large, several inches across, and pure white. It is a very handsome and fragrant species, and is less troublesome to keep than many of its kind. Native of

North America. Flowers in early summer, and continuously till late autumn.

C. taraxacifolia (*Dandelion-leaved Evening Primrose*).—This is a dwarf species, growing from 6 to 9 inches high, with procumbent stems. The leaves are coarsely and irregularly pinnatifid. The flowers are large, pure white, appearing in summer and autumn.

C. speciosa (*Beautiful Evening Primrose*).—This species grows about 2 feet high, the stems clothed with lance-shaped leaves, which, along with the stems, are somewhat downy. The flowers are white, appearing in great profusion at the extremities of the stems from June till September. Native of North America.

Zauschneria californica.—This, so far as I know, is the only representative of the genus either in nature or in cultivation. It grows about 1 or 1½ foot high, in neat graceful style. The stems are clothed with narrow oval leaves, and both are milky green. The flowers are produced on the axils of the leaves on short stalks. They are bright red or crimson, and appear in summer and autumn. The plant is easy to cultivate in warm situations and rich light well-drained soil; but in cold places and soils it is apt to perish from the combined effects of cold and damp. Care should be taken, if the soil is not well drained, to provide against stagnation at the roots, and this may be done by putting a few stones beneath the plant and elevating it somewhat above the general level a few inches; and along with these a covering of coal-ashes, or some such protection, placed over the crowns, will keep the plants safe from harm. Propagate by division in early spring, and by seed as described for *Oenothera* in spring, on a hotbed, when the plants will bloom the first season. Native of North America.

LYTHRACEÆ.

Although rich in splendid trees and shrubs from tropical and temperate regions, this natural order includes very little that is herbaceous, hardy, and ornamental. Some of the species of *Decodon* and *Nesaea* are known to cultivation as herbaceous plants; but they are of no ornamental value, and being limited in species, it is probable that those already in gardens furnish a fair standard whereby to judge of the merits of those not yet introduced. *Cuphea*, a greenhouse genus of suffruticose plants

—such of them at least as are perennial—furnishes a few species very fit for the adornment of beds and borders in summer; and being easy to propagate and keep up in stock, their aid in that way may be obtained at little cost where the most ordinary means for propagating tender plants by cuttings exist. But *Lythrum* is the only family of hardy herbaceous Loosestrifes at present in our hands that can be considered ornamental; in it there are a few species of great beauty.

L. salicaria (*the Purple Loosestrife*), a British species, is one of the best, and some of its varieties are among the most handsome of the ornaments of the herbaceous or mixed border. The species grows erect, about 3 or 4 feet high, with numerous square somewhat woody stems, so stout and firm in texture as to be independent of support. The stems branch but slightly near the top, and stems and branches terminate in long spikes of rosy-purple flowers, which are most effective either at a distance or near at hand: they appear in July, August, and September. The finest of its varieties is that named *roseum superbum*, which surpasses the type both in the size and brilliant colouring of the flowers. They are best fitted for growing in moist soil, though they cut a very good figure in that which is dry, if not extremely so. Besides their high value as border-plants, they are invaluable for introducing by the sides of streams and lakes, or in moist places anywhere. In such places they always flourish and appear to be thoroughly characteristic; and being able by their vigorous habit to take care of themselves against the encroachments of rampant neighbours, they may be established at small expense.

MELASTOMACEÆ.

Rhexia virginica.—This is the only hardy species of this fine order of plants in cultivation in this country. It is a rare plant, and likely to continue so on account of the very exceptional conditions under which only it will thrive or live even in cultivation. It is a native of sandy bogs in several of the States of North America, and will only live and develop its beauties in similar soil and conditions in our gardens. Deep sandy peat, abundantly moist, is essential to its healthy existence. The plant is very beautiful, and wherever the proper circumstances can be given it, it will well repay the trouble taken with it. It grows about 9 inches high, with numerous

quadrangular winged stems, thinly clothed with stalkless lance-shaped leaves, sharply toothed and fringed on the margin. The flowers are rosy purple, in terminal and axillary panicles, and are produced from June till August. Propagate by division in spring, as soon as activity is observable in the plants.

PORTULACÆÆ.

There are some beautiful hardy and half-hardy annuals included in this natural order; but I am aware of only one perennial herbaceous species that has any pretensions to be considered hardy. It is *Calandrinia umbellata*, and though classed amongst hardy perennials in trade catalogues, it is only hardy in very favoured situations. It is the hardiest of the genus which, in all its species, is treated as an annual group, though all we have in cultivation are perennial, and even become suffruticose under glass; but it endures our winters only when planted in dry light soil in warm sheltered aspects in the south of England. I have seen it succumb to the frost of an ordinary London winter, even when planted on the surface in the loam of that district; but on rockwork, or when extra precautions are taken to keep it dry, it does survive there and in equally mild localities. But though hardy only in the south, they are perennials that blossom freely the first year from seed if treated in the north as half-hardy annuals, and in the south as hardy annuals; and are therefore available at little cost and trouble for the decoration of the mixed border and rockwork; and succeeding as they do well in suburban gardens, they are in every way desirable plants for amateurs, and consequently deserve a place in these selections. As one species succeeds as well as another in the way suggested above, and all are beautiful sparkling plants, it will be best to describe several of the perennial species that are known to gardens at present. Their culture is most simple. They prefer a good dry soil and a sunny warm position, whether on rockwork, bed, or border. In the north the seed should be sown in March, in small pots in a slight hotbed, or in a cold frame set in a warm position. Small pots are recommended, because the plants do not bear transplanting well, and the seeds should be sown thinly; and in the case of the seedlings being too thick, they should be thinned out freely, leaving two or three of the most vigorous plants in each pot, and by this means they may be successfully trans-

ferred to their place in the borders or beds. In the southern counties of England the trouble of sowing in pots is not necessary, unless early bloom is desirable, as they succeed well when sown at once in the open ground; and in the north a longer succession may be kept up by sowing a little seed in early April in the same way.

C. discolor (*Two-coloured C.*)—This is a beautiful species. The plant grows 1 foot or more high. The leaves are thick and fleshy, bluntly egg-shaped, green, and slightly glaucous above and purple beneath. The flowers are very large, in long racemes, bright purplish rose, and composed of five broad spreading petals. Like the whole of the species of the tribe, the flowers expand only in sunshine. They appear in late summer and autumn. Native of Chili.

C. grandiflora (*Large-flowered C.*)—This species is very near the last in appearance. It grows about the same height; the leaves and flowers are smaller; the former grow on both sides, the latter a darker tint of the same rosy-purple colour. The flowers appear a week or two earlier. Native of Chili.

C. umbellata (*Umbelled C.*)—This species is very distinct from either of the preceding. The plant grows only about 6 inches high. The stems are prostrate and much branched, and the leaves are narrow, lance-shaped, and fringed on the margin with a few hairs. The flowers are produced in umbels, and are fine purplish crimson, appearing in early summer and lasting till September. Native of Chili.

CRASSULACEÆ.

The hardy section of this tribe comprises few genera but many species. A good many of them were old familiar plants in gardens; but they have for many years been lost sight of, their quiet unobtrusive style being scarcely tolerated while the rage for colour was rampant. Recently, however, some species of *Sempervivum* with rigid geometric aspect, and *Sedums* with close carpet-like growth or glaucous leaves, and several *Echeverias*, along with other plants of succulent or peculiar foliage, have been used to produce novel and pretty results in flower-gardening. It is a step in the right direction, and will serve to relieve the present style of flower-gardening from the ban of obtrusive monotony that has been laid on it for some time. Very few, if any, of the hardy *Crassulaceæ* are distinguished by

brilliant colours or showy qualities of any kind ; their peculiar recommendations are rather that they abound in soft tints of flower and foliage, and great variety of form and aspect—they are, in fact, generally humble quiet objects, but attractive and pleasing in a high degree. For the most part they are mountain rock-plants, generally affecting dry habitats where little else will grow but themselves ; they are therefore naturally well adapted for ornamenting dry rockwork, for planting in thin gravelly soil, on dry exposed banks, and for draping stumps and stones and old walls or ruins with a varied mantle of interesting vegetation. Many of them are excellent border-plants ; and, as already alluded to above, some are likely to become popular for many uses in the flower-gardens in bedding-out. They are plants of the easiest culture, flourishing abundantly in almost any soil but those that are excessively wet ; but special requirements of species for peculiar purposes will be noticed afterwards in the proper place. All may be propagated by division—that method is unmistakably suggested to even the casual observer by the *Sempervivums* generally, which divide themselves, more or less freely, annually ; but in nearly every case propagation in this tribe is the most simple matter, whether by division or cuttings.

Cotyledon umbilicus, syn. **Umbilicus pendulinus** (*Wall Navelwort*).—The genus *Cotyledon* is a small one, comprising plants of no striking ornamental qualities ; but they are useful for planting on old walls with a view to covering them, and are easily established in such positions if inserted in crevices where a little soil or decayed lime or stone exists—anything, in short, that will serve to retain them in their place, along with a little moisture, which is all they appear to want in the shape of nutriment. The species selected grows about 6 or 9 inches high. The leaves are thick, fleshy, and round, with a few remote teeth, and attached by their centres to the longish stalks. The flowers are greenish yellow in long racemes, and are produced throughout the summer. Native of Britain and Ireland, and many parts of western Europe.

Sedum.—This is the most numerous genus in the hardy section of the tribe. There is a large number of the species in cultivation, but they are chiefly confined to botanic gardens, and only a few of the more common are to be found generally in private ones throughout the country. Some are pretty border-plants, others are suitable for rock-gardens, and generally for furnishing dry gravelly places with vegetation, and draping stumps, old walls, and ruins. Hardy species only are

selected; but there are some tender ones, with peculiar and variegated leaves, that are valuable ornaments of the flower-garden; and some of the hardy ones are not inferior to these for the same purpose, and are becoming popular.

S. acre (*Common Stonecrop*).—This is a well-known British plant, abundant in many parts of the country on rocks and dry banks and walls. It forms close masses of weak trailing stems, thickly crowded with bright green, thick, short, almost globular leaves. The flower-stems are nearly erect, about 2 inches high; flowers bright yellow in small crowded cymes. This is an invaluable species for clothing old walls, stones, and dry sandy banks. There is a very pretty variegated form, which in spring assumes the appearance of a carpet of gold when planted in breadth; the tips of the shoots become bright golden yellow as soon as growth begins in spring. It is therefore a valuable plant for spring massing in dry light soil, but does not succeed so well in richer and wetter soils; it is quite easy, however, on a small scale, to provide a dry enough position for it under any circumstances, and the plant is well worth an effort. Both the species and variety are capital plants for suburban gardens; and although the species manages to make a tolerable existence on the face of a dry rock, it does not object to richer pabulum, and luxuriates in any soil not absolutely boggy. The variety is found in nurseries under the names *S. a. variegatum* and *S. a. aureum*.

S. album (*White Stonecrop*).—An elegant species, with numerous barren stems matting and creeping on the surface of the ground. The leaves are crowded, fleshy, and cylindrical. The flower-stems are erect, about 6 inches high, bearing pretty corymbs of pure white flowers, in some individuals also pink. They appear in June and July. Native of dry banks, rocks, and walls in Britain and Europe generally. Suitable alike for rock-work and beds and borders in light dry soil, and for clothing gravelly stony banks.

S. albo-roseum (*White-and-rose Stonecrop*).—This plant grows about 18 inches high, with leafy upright stems. The leaves are broad oblong, widening upwards. Flowers in large terminal corymbs, white and rose, appearing in summer. Native of Japan. An excellent ornament of the mixed border, flourishing in ordinary garden-soil.

S. Anacampseros (*Evergreen Stonecrop*).—A very distinct species, with numerous decumbent or creeping stems; the barren ones are crowded with wedge-shaped glaucous leaves in conical rosettes. Flower-stems nearly erect, somewhat leafy,

and terminating in a dense corymb of purplish flowers in July and August. Height about 6 inches. Native of the Alps and Pyrenees.

S. dasyphyllum (*Thick-leaved Stonecrop*).—This is a very attractive little plant, only an inch or two high. The stems are prostrate and weak, clothed with numerous thick, fleshy, almost globular leaves, deeply glaucous. The flowers are dull white, often pink or tinged with pink. A very pretty rockwork plant, but quite unsuitable for the border or flat surfaces, unless very dry. Native of the south of England, but rare—and widely spread in Europe, but not abundant.

S. Ewersii (*Ewers's Stonecrop*).—A very dwarf species 2 or 3 inches high, with flat, succulent, toothed, deeply-glaucous leaves. The flowers are purplish rose, in pretty terminal corymbs, appearing in July and August. This is one of the most choice and handsome of the dwarf Sedums, and is a beautiful ornament of rockwork or border, but in the latter must be provided with a dry warm soil. Native of the Altai Mountains.

S. Fabaria (*Large purple Japan Stonecrop*).—The plant grows erect, with stout stems 1 foot or 18 inches high, furnished with broad oval leaves, glaucous and toothed, and standing horizontally on the stems. The flowers are rosy purple, in dense broad corymbs, appearing in September and October. Native of Japan. This is perhaps the handsomest of the tall-growing species. It is worthy of a place in the choicest collection of hardy plants, being very distinctive and beautiful. It is useful for flower-gardening on the bedding method, either in the way of breaking the uniformity of large flat surfaces or for centres to small beds; and where the style is formal and severe its rigid aspect will be found to harmonise well with the surroundings. For this purpose the plant is best divided annually into single crowns in early spring, and assisted with a little heat for a time. It is perfectly hardy, but flowers rather too late to be of much use in cold late districts in Scotland as a flowering plant; but its habit and glaucous hue are valuable and desirable for their own sakes.

S. kamtschaticum (*Kamtschatka Stonecrop*).—This species has numerous prostrate barren stems clothed with opposite, roundish, regularly-toothed, dark-green, flat leaves. The flowering-stems ascend a little, terminating in a corymb of deep-yellow flowers, which appear in July and August. Native of Kamtschatka. A very good border species, and handsome also on rockwork. Height 6 to 9 inches.

S. oppositifolium (*Opposite-leaved Stonecrop*).—This species

grows only a few inches high. Like the last, it has prostrate barren shoots clothed with opposite wedge-shaped leaves, flat and toothed. The flowers are in corymbs, are dull white, and appear in summer and autumn. Native of the Caucasus. A useful border species.

S. populifolium (*Poplar-leaved Stonecrop*).—This is one of the most distinct, though not the most beautiful, of the group. It assumes rather a shrubby habit, about 1 foot high. The leaves are flat, heart-shaped, toothed, and supported on stalks that are lengthy for a *Sedum*. The flowers are in terminal corymbs, and dull white, with purplish carpels and pistils. Flowers in July and August. Native of Siberia.

S. Rhodiola, syn. **Rhodiola rosea** (*Roseroot Stonecrop*).—This is a well-known old-fashioned border-plant, common in many cottage gardens in the country. It is not highly ornamental, but has a good deal of distinctiveness about it. The stems are leafy, stout, and erect, about 1 foot high. The leaves are oblong, toothed, and slightly glaucous. The flowers are in terminal close corymbs, and each flower contains only one sex, either male or female; and in colour they are in different individuals either yellow or purplish, the former in nature being the most prevalent. Native of the mountains of Britain and the mountainous countries of Europe and Asia.

S. rupestre (*Rock Stonecrop*).—This is a dwarf creeping species, forming lowly masses of barren stems, and branches clothed with awl-shaped cylindrical leaves, more or less glaucous in hue. The flowers are in terminal cymes, composed of several recurved branches, and bright yellow, appearing in July and August. Native of Britain and various countries of Europe. Two slightly-differing varieties are circulated in gardens as species under the names *reflexum* and *Forsterianum*, but they are not desirable in any good collection together.

S. sempervivoides (*Houseleek-like Stonecrop*).—This species differs from all the preceding. The leaves are thick and succulent, egg-shaped, with an abrupt sharp point, and somewhat hairy above and below, and arranged in close compressed rosettes. The flowers, in terminal corymbs on erect stems, are dark purple, appearing in July and August. Height from 9 inches to 1 foot. Native of Iberia.

S. sexangulare (*Six-angled Stonecrop*).—This is near in aspect to *S. acre*, but is quite distinct. It has the same close mat-like growth, but the leaves are longer, narrower, and darker green. The flowers are bright yellow, in the manner of those of *acre*, but begin to open as the latter become exhausted, and

continue for a couple of months. Native of Britain, but rare—and of other countries of Europe.

S. Sieboldii (*Siebold's Stonecrop*).—A very distinct and handsome plant. The stems are slender, erect at first—in established plants afterwards arching outwards. Leaves in opposite pairs or threes, roundish, flat, and glaucous, as are the stems and all parts outside the corolla. Flowers pink or rose in handsome corymbs. Native of Japan. Quite hardy, but in cold wet localities in Scotland flowering too late to be of any use, as the flowers are cut up with frost or cold and wet combined. It is a very useful early winter greenhouse plant, when well cultivated in pots. There is a very handsome variegated form.

S. spurium (*Fringed Stonecrop*).—This is a prostrate species, with numerous barren shoots matted on the surface of the ground. The leaves are numerous, flat, roundish, or wedge-shaped, and toothed, having a fringe of minute, sharp, semi-transparent hairs on the margin. Flower-stems decumbent at the base, ascending only an inch or two, bearing heavy corymbs of bright rose-coloured flowers. Flowers from July till October. Native of the Caucasus. This is one of the best of the dwarf border species, and beautiful also on rockwork.

S. Telephium, syn. **S. purpureum** (*Orpine Stonecrop*).—This species grows erect, with hard unbranched stems, to the height of about 18 inches. The leaves are oblong and coarsely toothed, scattered irregularly on the stems—sometimes distant, but often nearly opposite, in pairs or threes. The flowers are in handsome pyramidal dense corymbs, and purple. They appear in August and September. Native of Britain and northern and central Europe. It is a useful border-plant, and may be used to adorn semi-wild places, either in moderate shade or bright sunshine, if the natural vegetation is not too tall. One of its popular names—*Livelong*—is suggestive of its tenacity of life, and it possesses that quality in a high degree; in fact, if turned out roots uppermost, it will rear its head in spite of the rude inversion, and proceed to establish itself without delay on a new basis.

Sempervivum (*Houseleek*).—This family is possessed of the strongest tenacity of life—the generic name implies that; and it is highly interesting on account of the rigidly geometric arrangement in rosettes that the leaves of most of the species take. Their extraordinary power of life renders them useful for many ornamental purposes that are very desirable, but not by any means generally adopted. Many a stump and block and naked rock might be appropriately garnished with them; and those objects,

often inert enough and uninteresting in themselves, but from various circumstances, perhaps, irremovable, would by such adornment become attractive and beautiful; and quaint old trees and ruins may be enriched in their own style by the same means. The natural habitats of the Houseleeks—housetops, walls, rocks, and generally dry exposed stony or gravelly places—at once suggest their fitness for the uses indicated. They establish themselves easily in such places in nature; and in practice to fix them in any position is a very simple matter, all that is needed to that end being a little clay and horse or cow dung, well mixed, as for use in grafting, on which to stick the offshoots, when, even if the surface is vertical, they may be left to themselves without any misgivings as to success. The adaptability of some of the species to another and very different use in flower-gardening has been noticed and taken advantage of by some of our best gardeners recently, and is becoming popular. I allude to the new method of bedding out, in which various Sempervivums are used to define intricate geometrical figures in beds or borders, the spaces being filled, according to the taste of the parties concerned, with flowering plants, or with plants of different foliage, with a view to the production of contrasts in form or combinations of colour and form; and for defining with precision intricate lines and figures, there is perhaps nothing in the vegetable kingdom more fit than these peculiar plants: but for this purpose they must be used in single rosettes, which entails the necessity of their being overhauled annually in spring, so as to remove all offsets or young rosettes which would mar the lines. They are as easily cultivated on flat surfaces on the ground-level as on any elevation, and though adapted to exist on short commons, do equally well in the richest soil, but it is always advisable to drain well under them.

S. arachnoideum (*Cobweb Houseleek*).—An extremely interesting and curious plant. The rosettes are small, composed of oblong sharp-pointed leaves, thickly set on both surfaces with soft, short, glandular hairs. The tips of the leaves are connected by radiating lines of delicate white threads, so interwoven with each other as to suggest the idea that a spider had been at work upon them. The flower-stems rise a few inches high. The flowers are pink, composed of twelve or more spreading petals, and appear in July and August. Native of the Alps and Pyrenees.

S. arenarium (*Sand Houseleek*).—The leaves in this species, in small rosettes, are lance-shaped, smooth above and below,

but fringed on the margin. Flowers composed of six yellow petals. Height about 6 inches. Native of the Tyrol.

S. californicum (*Californian Houseleek*).—A very handsome species, with broad hemispherical rosettes, composed of oblong, glaucous, brown-tipped leaves, terminating in an abrupt sharp point. Flowers purplish, composed of twelve or more spreading petals, appearing from June till August.

S. Funckii (*Funck's Houseleek*).—Leaves in rather large rosettes, oblong, with an abrupt sharp point, downy above and below, and fringed with long hairs. Flowers pink, with usually twelve petals, appearing in July and August. Native of the mountains of Tyrol, Carinthia, and Salzburg.

S. globiferum (*Globular Houseleek*).—The rosettes in this are rather small, and open in the old ones; very small, close, and globular in the young offsets. Leaves lance-shaped, smooth above and below, but fringed. Flowers yellow, few, but very large; petals more than twelve.

S. hirtum (*Hairy Houseleek*).—Leaves oblong, acutely pointed, hairy on both sides, and fringed. Flower-stems from 9 inches to 1 foot high. Flowers white; petals six, the tips hairy; appearing in July and August. Native of Italy and Austria.

S. montanum (*Mountain Houseleek*).—The rosettes are close and compact. The leaves are oblong, widening somewhat upwards, but terminating in an abrupt sharp point, and fringed. Flower-stems 6 to 9 inches high. Flowers dull rose or purple; petals twelve; appearing in July and August. Native of the Alps.

S. soboliferum (*Hen-and-Chicken Houseleek*).—In this the rosettes are close and compact, composed of oblong, wedge-shaped, sharp-pointed leaves with fringed margins. Flower-stems about 6 inches high. Flowers pale yellow; petals six, fringed. Native of Germany.

S. tectorum (*Common Houseleek*).—The rosettes are large and hemispherical, composed of oblong lance-shaped leaves, terminating in a sharp rather abrupt point, the margins fringed. Petals twelve or more, pink; appearing in early summer, and continuing late. Native of many countries of Europe, high on mountain-ranges, and not uncommon on walls and house-tops in Britain.

SAXIFRAGACEÆ.

This is an extensive family, especially so in hardy herbaceous perennials. There are only five or six genera, comprising orna-

mental hardy herbaceous species at present represented in gardens, and there is no great prospect of increase in these by importation; but in species there is good reason to believe that there are many more to come; and judging by what we already possess, we may expect that new introductions will be good, and worth receiving. But there are already many species in cultivation, and amongst them will be found selections adapted to many purposes in out-of-doors gardening, and in-doors too, but that does not lie in our way at present. *Saxifraga* is the most numerous in species, and is altogether the most valuable in an ornamental sense. *Astilbe* and *Hoteia* are nearly allied, and together furnish a few species elegant alike in flower and foliage. *Francoa* is worth a place in mixed borders. *Parnassia* is both curious and beautiful, and *Drosera* (by Mr Bentham and others, included in this order), though not high in ornamental value, is peculiarly interesting, and therefore worthy of some notice here, for the sake of those who have the facilities and scientific enthusiasm essential to its successful culture. There are other hardy herbaceous genera, such as *Henckera*, *Tellima*, *Mitella*, &c., interesting enough botanical subjects, but not popularly so, and being very inferior decorative plants, they are unworthy of farther notice. The whole of the selected genera are easily propagated by seed and by division, and some species of *Saxifraga* and *Francoa* may also be increased by cuttings, but division is the simplest and handiest way once stock is in hand. Other particulars of culture will be noticed under the various genera and species as they turn up.

Astilbe.—Only two or three species of this genus are known to cultivation. They are elegant rather than showy plants, with handsome compound leaves and branching racemes of very small but numerous flowers. They are best fitted for the mixed border, flourishing in a mixture of peat and loam and sand, well drained, yet requiring much moisture during the growing season. They may also be planted on the margins of lakes and streams, for which their graceful style fits them well.

A. decandra (*Decandrous A.*)—This species grows about 2 or 3 feet high, with large, spreading, twice-ternate leaves; the stems, stalks, and both surfaces of the leaflets, clothed with long rusty hairs. Flowers creamy-white, in long somewhat branched racemes resembling some of the herbaceous *spiræas*, appearing in July and August. The plant is a native of Carolina. It is hardy enough to exist in any part of the country from year to year; but it suffers often in spring in cold wet localities which are subject to late frosts, after having made some growth.

A. rivularis (*Brook A.*)—This plant resembles the last, but is taller, and the flowers are dusky brown, in the same style of inflorescence, appearing in July and August. Height about 4 feet. Native of North America. Hardier than the last, and suitable for the same purposes.

A. rubra (*Red A.*)—This species is of the same character as the preceding, but is nearer the first than the last. It grows about $2\frac{1}{2}$ or 3 feet high, with densely-hairy stems, and leaf-stalks and leaves, and the hairs being crimson give the plant a striking appearance. The flowers are red, in the same character of inflorescence, and appear about the same time as the others. Native of Nepal. I have had no experience of this striking plant north of London, and cannot recommend it as hardy in the north.

Francoa.—This is a genus of very few species, all from Chili. They are all very much alike in aspect, and all suitable only for mixed borders or larger rockworks. They prefer rich well-drained light loam and a sunny position.

F. sonchifolia (*Sowthistle-leaved F.*)—This species forms compact tufts of leaves similar in form to those of the Sowthistle, as the name implies; but they are dark green, and softly but not densely downy. Flower-stems 2 or 3 feet high, unbranched, bearing a terminal raceme of rosy-purple flowers, appearing in July and August.

Besides the above there are two other species in gardens—viz., *F. appendiculata* and *ramosa*, both worthy of culture in large collections; and there is a white variety of the former, which cannot, however, be considered an acquisition, being rather dusky.

Hoteia japonica, *syns. Spiræa and Astilbe japonica.*—This is the only representative of the genus in gardens in this country. It forms handsome, rather crowded, masses of biternate dark-green shining leaves, the stalks and leaflets clothed with short rusty hairs. The flowers are produced in graceful pyramidal panicles, pure white, as also are the ultimate pedicels, but gradually in descending the stalks become bright rosy-red or purple, thus giving an additional charm to the plant. Flowers in June and July. The plant is a native of Japan, and, like the *Astilbes*, it is unsuitable for cold wet localities. It delights in light, rich, well-drained soil, and is fond of peat; and if attempted in the north, it should be accommodated with a good sunny position. It is becoming very fashionable as a pot-plant for greenhouse decoration, and few plants used for that purpose are more attractive when it is well done; and it may be forced with ease and success if care is taken not to overdo it with temperature. Height 1 to $1\frac{1}{2}$ foot.

Parnassia.—This is a beautiful and peculiar genus, comprising few species. The beautiful arrangement of the stamens—five fertile or perfect, and five imperfect, the latter surmounted by filaments and balls—will reward a deeper than mere casual examination. They are dwarf plants suitable for culture in moist soil, either in shade or sunshine; but abundant moisture is of the first importance in whatever aspect the plants may be located. They are, in fact, natives of sandy bogs and wet hill-sides, and prefer an oozy condition as regards moisture, otherwise they appear indifferent to the kind of soil. Easily increased by division; but should seed have to be resorted to, it should be borne in mind that, in common with most bog-plants, the seed of these should be sown as soon as ripe; or if to be transported a distance, let them be put in some moist medium, and be kept moist till they are finally committed to the earth where they are to remain, or in pots in a cold frame; ultimately, when big enough, to be transferred to permanent quarters.

P. asarifolia (*Asarum-leaved Grass of Parnassus*).—This species grows about 1 foot high, forming tufts of dark-green, roundish, kidney-shaped root-leaves smooth and shining. The flower-stems are erect and naked, except for one leaf placed about halfway up each stem, bearing one large five-petalled white flower. Flowers in July and August. Native of North America.

P. caroliniana (*Carolina Grass of Parnassus*).—In this species the principal superficial distinction is in the leaves, which are roundish, oval, heart-shaped. The flowers and arrangement of stamens are very similar to the last, but the flower-stems are usually stronger and taller. Flowers about the same time as preceding. Native of North America.

P. palustris (*Marsh Grass of Parnassus*).—This is a British species, and quite distinct from either of the preceding. The colour of the flowers is the same, but the leaves are smaller and are acutely heart-shaped. The imperfect stamens have ten or more small yellow globular bodies attached to their tops, instead of three, as is the case with the other two species. The plant is, besides, smaller than the others, rarely exceeding 9 inches high. Flowers in July and August.

Saxifraga (*Saxifrage*).—This genus is pretty well known, being not uncommon in various forms in gardens generally throughout the country. It comprises, however, a large number of species which are not by any means familiar occupants of gardens. There is great diversity of character of foliage and inflorescence amongst the species. There is a large group with

peculiar grey, encrusted, margined leaves, which are often arranged with the greatest symmetry in rosettes—resembling in style the Houseleeks already described, and in a certain degree fitted for the same purposes—and in which the compound inflorescence of the Saxifrages reaches its greatest development. Another section is characterised by the brightest and softest green leaves, producing the same effect when planted on banks as that of the verdant mosses ; and these are very floriferous, although their inflorescence is much more simple than that of the first-mentioned group. The very diminutive and interesting opposite-leaved group is beautiful in flower and useful in its straggling mat-like growth, and the large-leaved species form a strikingly distinct section of useful border-plants. The London Pride, and the few species that closely resemble it, are pretty graceful plants, having features distinct from all the foregoing groups, and are very useful plants for a variety of purposes. *S. granulata* and *S. Hirculus* are each distinct from any already mentioned and from each other, and they are the handsomest of their respective groups at present in cultivation. There are other distinct groups, but these include the most ornamental and useful species ; and amongst them are to be found many plants of great elegance and beauty, many at present very little used in the larger and best gardens, but sparingly confined to those of amateurs and cottagers, or in many cases only to be found in botanic gardens and a few nurseries. There will be occasion afterwards to notice particularly the requirements of certain species with respect to their use and culture ; and all that need be said on the subject of culture at present is, that they are easily propagated by division, but in the case of the very small kinds some extra care will be required in the operation, so as not to divide too minutely, and always to secure a little root with each part. If seed should be resorted to as the means of increasing stock, or making additions to the collection, it should be sown in spring in small pots in a cold frame, and afterwards pricked out into nursing-beds as soon as they are fit to handle easily, or into pots if only small numbers are wanted, afterwards transferring them, when strong enough to take care of themselves, to their permanent quarters.

S. aizoides (*Smaller Yellow Mountain S.*)—This is a slightly-tufted species, with narrow, bright-green, thick, and rather leathery leaves. The flower-stems ascend to the height of about 6 inches, bearing loose few-flowered panicles of bright yellow blossoms in July and August. It is a widely-distributed plant in alpine and arctic districts of Europe, Asia, and

North America, and is British. It flourishes best in moist sandy soil, on rockwork, or in the mixed border.

S. Aizoon (*Aizoon S.*).—This is one of the group with encrusted leaves. The leaves are produced in rosettes, are blunt, tongue-shaped, margined with close sharp teeth and a grey encrustation. The flower-stems are about 9 inches or 1 foot high, branching near the summit, and bearing on each branch several greenish-white flowers in July and August. Native of the Vosges and Bohemia and the Alps, generally on moist rocks. In flower the plant is comparatively valueless; but the grey rosettes of leaves prettily ornament rockwork in sunny moist positions; and the rosettes, carefully divided and cultivated for the purpose, are useful also for edgings and geometric lines in the flower-garden. It prefers light, rich, moist soil; but succeeds fairly in different kinds, if not stagnant and heavy.

S. Andrewsii (*Andrew's S.*).—This sort has somewhat of a mongrel aspect. It has the tongue-shaped leaves and rosette arrangement of the encrusted species, but the margins lack the characteristic serratures of that group, and have instead the regular, blunt, and conspicuous teeth of the London Pride S., and the bright intense green of that species, along with the faintest tracing of the grey incrustation peculiar to the others. In the flowers and flower-stems there are other resemblances to the London Pride S.; but the style of inflorescence is more like that of some of the encrusted kinds, being more rigid than that of London Pride. It is a very handsome plant, and very accommodating as regards soil and position, doing well in any. It is without any authentic history, but is supposed to be a hybrid, and was first discovered in Ireland.

S. aretioides (*Arctia-like S.*).—A very diminutive species. The leaves are small, linear, widening somewhat upwards, arranged in tiny rosettes and covered with a grey incrustation. The flower-stalks are 1 inch or 2 high, clothed with glutinous hair, bearing a compact corymb of few golden-yellow flowers. Flourishes best on rockwork in light sandy loam, in a sunny but moist position. Flowers in June and July. Native of lofty rocky stations on the Pyrenees.

S. biflora (*Two-flowered S.*).—This is one of the opposite-leaved group. It forms straggling mat-like masses of weak, prostrate stems, crowded with small, thick, dark-green leaves, widening a little towards the point. The flowers are produced on short erect branches, in heads of two or three together; they are large, deep rose, and appear in July and August. Native of the Alps and Pyrenees, in the loftiest positions at snow-line. Adapted best for sunny moist positions on rock-

work, in light gritty soil, but not averse to the level border in light rich soil if moist, yet well drained. A few stones inserted in the surface about it when planted will be found beneficial, as preventive of excessive evaporation, and consequent fluctuations of temperature, which are inimical to the continued well-being of these natives of frigid homes.

S. cæsia (*Grey S.*)—This is another small species, and nearly related to the last. The plant produces minute tufts of blunt, grey, encrusted leaves, somewhat triangular. The flower-stalks are 2 or 3 inches high, bearing a few pure-white flowers in June and July. Native of lofty positions on the Alps, Apennines, and Pyrenees. An interesting and pretty species, requiring a moist sunny position on rockwork.

S. cæspitosa (*Tufted S.*)—This species forms close compact cushions of lively-green leaves, cut into several bluntish lobes. The flower-stems rise from 2 to 4 inches high, bearing several white flowers. This is one of the handsomest of the tufted moss-like section; but is variable, and on some of its extreme variations specific characters have been founded by different botanists. The forms so distinguished are perhaps satisfactory scientifically, but practically there is only embarrassment attendant on the culture of them in the same collection. The names *groenlandica*, *palmata*, and others, have been applied to different forms of this species; but they all partake in different degrees of the close-tufted habit of the species, although they may and do vary in points of some consequence to science, but of little importance to the cultivator, whose main consideration is decoration. The best of the forms that have been so distinguished are the two just named. *S. cæspitosa* is a native of various alpine countries of Europe, and a not very common native of Britain. Both the species and the related forms succeed in almost any garden-soil, and in any situation, and are very attractive plants for the front lines of herbaceous borders, while they are beautiful coverings for sunny moist banks, and are not altogether averse to a little shade.

S. ceratophylla (*Horn-leaved S.*)—This is one of the handsomest of *Saxifragas*. It forms symmetrical tufts of intense green, rigid leaves, divided into several horn-like segments. The flowers are produced in graceful panicles, are snow-white, and appear in May and June. Native of Spain, and succeeds in any soil and position, but worthy of the best.

S. crassifolia, syn. **Megasea crassifolia** (*Thick or large-leaved S.*)—This is one of a limited but very distinct group of species characterised by very large leaves. It grows from 9 inches to 1 foot high, producing bold masses of large, broadly oval, dark-

green leaves, shining and quite destitute of hairs, often, but not always, slightly heart-shaped at the base, and when fully exposed to the sun becoming lustrous and tinged with reddish bronze in autumn. The flowers, which are not always very conspicuous, from their being on short stout stalks, and rarely rising above the leaves, are large, pale-purple, or pink, in close almost spike-like panicles, appearing from March onwards for two months. Native of Siberia. A very useful plant for mixed borders, and for introducing in sunny parts of woods and banks in half-kept places.

S. ciliata (*Fringed-leaved S.*)—This belongs to the same group as the last, and, like it, bears the generic synonym *Megasea*. It is a smaller plant in all its parts than the Large-leaved S., but has the same habit of growth and similar inflorescence. It grows from 6 to 9 inches high, bearing roundish, obovate, dark-green, thick, and rather leathery leaves, hairy on both surfaces, and not on the margin only, as the specific name would imply. The flowers are on stout short stems, in moderately-open panicles, and are white suffused with pink, appearing in May and June. Native of northern India. The plant is perhaps suitable only for culture in the open air in the south of England; my experience of it does not extend farther north than London in the open air, but I have not always seen it quite scathless in even that favoured locality. It is, however, so pretty and distinct, that wherever it may be grown it should be tried. The *S. ligulata*, nearly related to this species, differs from it mainly—speaking from a gardener's point of view—in having both surfaces of the leaves smooth, but the margins densely fringed, and the flowers a deeper pink or purple. It also is a native of northern India, and rather tender.

S. cotyledon (*Pyramidal S.*)—This is one of the encrusted-leaved section, and perhaps the most handsome of that group. It produces large rosettes of tongue-shaped leaves, blunt and rounded at the points, margined with regular saw-like teeth, which are encrusted with grey. The flower-stems often, under generous cultivation, reach the height of 2 or 3 feet, producing immense pyramidal open branching panicles of white flowers. They appear in June and July, but may be had much earlier in pots under glass. Native of the Alps and Pyrenees. This is one of the most elegant and beautiful of alpine plants. It is difficult, indeed, to realise its striking beauty without seeing the plant in its glory. The inflorescence is out of all proportion to the comparatively small rosettes whence it springs. The rosettes are very symmetrical, and may be used with good

effect in geometric arrangements in the flower-garden, although this is not, I think, the most legitimate use of such a handsome flowering-plant. Its finest effects will be produced when planted in warm sunny borders, in rich, light, moderately moist, but well-drained soil; and being a rock-plant, it is well adapted to succeed on rockwork; but as the most perfect development of its fine panicles can only be produced under favourable conditions, the soil should be good rich gritty loam, and abundant moisture must be provided after growth commences. It will grow, however, though something short of perfectly, in less encouraging circumstances, and may be planted in fissures, natural or artificial, where a little soil can be secured for it to root in; and if the position is moist, it may be planted on the crowns of rocks, and succeed in very little soil indeed. It is well worth cultivating in pots for greenhouse decoration, and also for rooms, and a considerable succession of bloom may be kept up for this purpose by having batches brought in at different times successively.

S. diapiensoides (*Diapiensia-like S.*)—A very diminutive but pretty and interesting species. It produces close tiny rosettes of blunt, narrow, oblong, or linear grey leaves. Flower-stalks are short, about 2 inches high, bearing a few white flowers, appearing in June and July. Native of St Bernard, Mont Cenis, Monte Rosa, and the Alps and Pyrenees, generally at high altitudes. Most fit for ornamenting rockwork, associated with other diminutive alpine apart from encroaching neighbours; and is fond of a little peat, with light loam and plenty of grit, and an abundant, or rather continuous, supply of moisture in summer, or when growing.

S. Geum (*Kidney-leaved S.*)—This species is indigenous to Ireland, and well known in gardens as a border-plant. The leaves are round or kidney-shaped, dark green and heart-shaped at the base, and having a few scattered hairs on both surfaces. The flowers are borne in elegant open panicles, are small, white, or pink, spotted with deeper red. There are two well-marked varieties of this plant in gardens, usually accounted species and circulated under the names *elegans* and *hirsuta*; they are distinct as varieties, but insufficiently so as species to be admissible in any collection of distinct ornamental species. It is a useful border-plant, and succeeds well in very ordinary soil in shady places.

S. granulata (*Meadow S.*)—This is another indigenous species, quite distinct in every respect from any of the preceding. The plant forms numerous small bulbs, by means of which it is easily increased. The stems grow about 6 or 9

inches high, branching into handsome panicles of creamy-white flowers. There is a handsome double-flowered variety which forms a very superior border-plant worthy of a place in the choicest collections. Both double and single may be naturalised on sunny banks and glades amongst other spring and early summer flowers. Flowers in May and June.

S. Hirculus (*Marsh S.*)—This is a peculiar and ornamental species affecting marshy habitats on the mountains in a few localities in Britain. It has weak prostrate stems, clothed with oblong narrow smooth leaves, quite entire on the margin. The flower-stems are nearly erect, about 6 inches high, bearing a solitary yellow flower. The plant is handsome under congenial circumstances—that is, in very moist peaty soil, or even in loam when wet—but is otherwise unworthy of culture for ornament. Native also of western Europe, and many countries of Asia.

S. hypnoides (*Mossy S.*)—This species is related to *cæspitosa*, and, in the bright verdure of the leaves and general aspect of the plant, strongly resembles that species. But it has a freer and more spreading habit of growth, and rarely assumes the cushion-like tufts of the Tufted S. The branches spread out weakly, trailing and matting freely. The leaves are sometimes entire, but often also cleft in three or five parts, and are bright green. The flower-stems are erect, about 6 inches high, bearing several large white flowers in April, May, and June. A rather abundant native of Britain and other countries of Europe on the mountains. It is not an uncommon species in gardens in one or other or several of its varieties. Like *cæspitosa*, it is a variable plant, and the varieties of both are vended and circulated as species, and are often confounded with each other, and indeed it is not easy always to distinguish them; but it may be said of all that they are quite worthy of a place in any collection, being all beautiful border or rock plants, and not very fastidious about soil, provided it is tolerably moist, yet well drained. The following names are those applied to certain more or less well-marked forms of this plant or reputed allied species, having the authority of botanists both British and Continental, but which are all too much alike to merit places in collections of ornamental plants, on the score of adaptability to produce distinct effects: *S. affinis*, *decipiens*, *elongella*, *hirta*, *incurvifolia*, *leptophylla*, *platypetala*, and *pulchella*: the first and last of these are perhaps the most distinct and beautiful of the group, and the most dissimilar from *hypnoides*, speaking floriculturally.

S. longifolia (*Long-leaved S.*)—This species is a near relative

of the Pyramidal S. The leaves are narrow, linear, and encrusted, arranged in large spreading star-like rosettes 8 or 10 inches in diameter. The flower-stems are stout, about 2 feet high, clothed with glandular hairs, and bearing a rather close pyramidal panicle of numerous white flowers. This is a very handsome and striking plant, adapted to the same purposes as the Pyramidal S., and rivalling it in the beauty and abundance of its splendid inflorescence. The same soil and other requirements as the Pyramidal S. Flowers in July and August.

S. oppositifolia (*Purple Spring S.*)—This is a near relative of *biflora*, and is the only spring-flowering species of the section to which it belongs. It grows only an inch or two high, forming weak straggling stems crowded with small dark-green thick leaves as broad as they are long, thickening at the point, and somewhat keeled or triangular there. The flowers are large, solitary, fine bright purple, appearing in April, May, and June. Native of Britain and many parts of Europe and temperate and frigid Asia. It is a most distinct and beautiful plant, becoming a carpet of purple when in flower, and at other times very pleasing in its diminutive carpet-like growth. It may be cultivated on rockwork or border, in gritty moist loam, with the greatest success in sunny positions. When grown in borders it is advisable to put a few rough porous stones under and about it, especially if the soil is of a very retentive nature. The species *retusa* and *Kochii* are both allies of this, and are pretty plants, being intermediate between *oppositifolia* and *biflora*; and as they furnish no decorative features distinct from these, they need not be further noticed here. The varieties *S. o. major*, *S. o. alba*, and *S. o. pallida*, are worthy of notice.

S. purpurascens (*Large-leaved purple S.*)—I am doubtful if this plant is now in cultivation; indeed I think it is not; but it is so much superior to any other species of the large-leaved section at present in cultivation, that I must here describe and commend it to cultivators in the hope that, if lost, measures may be taken to reintroduce it. It is related to *crassifolia*, and similar in habit though not so coarse. The leaves are broadly oval, smooth, bronze-green, and lustrous. The inflorescence is on stout stalks, and like that of *crassifolia*, but the flowers are dark purple or purplish crimson. It is a native of northern India, and was introduced to Kew about the year 1856 or 1857, and flowered in 1858, when it was figured in the 'Botanical Magazine.' My experience of it is too limited to enable me to speak with confidence respecting its hardiness; but in that respect it is probably equal if not superior to

ciliata from the same country, if not from the same habitat. I can only say that it endured two winters at Kew with impunity in the open ground.

S. Rocheliana (*Rochel's S.*)—This is another of the dwarf encrusted-leaved section producing rosettes of grey, margined, short, blunt-pointed, lance-shaped leaves. The flowers are white, few together, on stout erect stalks, appearing in April and May. Native of Austria, and is best adapted for rock-work decoration in warm sunny positions.

S. umbrosa (*London Pride S.*)—This is so familiar in gardens, and so little liable to be confounded with any of its near relatives, that description is not required. Its elegant style of beauty and colouring renders it worthy a place in every collection of hardy border-plants. It is not so frequently seen about woods as the name and the capabilities of the plant for enduring shade would lead one to expect. It is a pretty ornament of mixed borders, and is useful in a variety of ways for edgings and for city gardens, as it has the power of resisting the evil influences of smoke and dust in a high degree. Any ordinary soil is suitable for it. Native of Ireland and Spain and Portugal in shady places. Flowers in June and July.

UMBELLIFERÆ.

There is very little floral beauty in this great tribe of plants. One or two species of *Astrantia*, *Eryngium*, and *Meum* may be admissible amongst ornamental plants on account of the combination of a little beauty and much curious interest that they possess, but not any of them are gay plants, although the *Eryngiums* are undoubtedly very striking. There are other genera that furnish species with striking or handsome foliage, but I am not aware of any besides *Astrantia* and *Eryngium* that can be said to approach anything like floral beauty; and the beauty of these does not depend on the flowers but on the leaves of the involucre, which are coloured or otherwise interesting and conspicuous. One or two species of each of these genera and of *Meum* it may be advisable to notice and describe. Beyond this it is scarcely needful to go, as many of the species which might be recommended as possessing fine leaves become troublesome weeds under cultivation; and some of the best of them, again, are often more difficult to keep than better things

of the same character, or that are at least equally well adapted to produce the same results.

Astrantia (*Masterwort*). — There are five or six species of this genus grown in botanical gardens in this country, and one or two are to be met with very rarely in private collections. They are very easily cultivated, and are mountain-plants, often inhabiting shady places. Sandy loam, moderately rich, suits them well, and they are easily increased by division. The species selected is, I believe, the most ornamental of the group, and is quite worthy of a place in any collection of mixed herbaceous border-plants.

A. carniolia (*Carniola Masterwort*). — This plant grows about 1 foot high, having a tuft of five-lobed root-leaves and upright flower-stems bearing small, close, simple umbels of dusky greenish pink flowers and a conspicuous star-like involucre, composed of twelve or more narrow lance-shaped leaves, striped dull greenish-white and red. The flowers appear in May and June, and often well through July if the plant is encouraged with water, which it likes. Native of Carniola and Carinthia in moist upland pastures.

Eryngium (*Eryngo*). — This genus comprises several very striking species, resembling some of the Thistles at first sight, owing to the peculiar character of the involucreal leaves surrounding the usually dense, compact, bluntly spike-like heads of flowers. They flourish best in light sandy soil, and might be useful for the decoration of ruins; and are not at all unfit for mixed borders, being handsomely coloured in all the parts in the upper half of the plants selected. They are pretty objects for maceration, for the purpose of making skeletonised bouquets and devices. The veins being stout, woody, and elegantly arranged, render them very attractive when well done in that way.

E. amethystinum (*Amethyst Eryngo*). — The plant grows between 2 and 3 feet high, with stout woody stems clothed with deeply-cut and jagged hard leathery leaves, grey, green, or glaucous often below, but growing gradually blue, as do also the stems and every part of the plant, and increasing in depth of shade as the flowers are reached. The involucreal leaves are about eight in number, enclosing the heads of flowers. Flowers in July, lasting for a month or two. Native of the Tyrol, Trieste, and Tivoli.

E. maritimum (*Sea-holly Eryngo*). — This species grows 1 foot or 18 inches high, with very rigid, erect, freely-branching stems. The leaves are pale-bluish green, divided into three lobes, stiffly wavy and prickly on the margin. The involucre

consists of about eight prickly leaves, pale greyish blue, and the head of flowers is a darker shade. Flowers in July and August. A common sea-coast plant in Britain and other countries of Europe.

The following species are no less worthy of notice, but as they possess little that is distinct ornamentally from the foregoing, it is unnecessary to describe them: *E. alpinum*, blue; *Bourgati*, blue; *cæruleum*, blue; *planum*, blue.

Meum Athamanticum (*Spignel*).—This plant is worthy of a brief notice on account of the beautiful masses of finely-dissected leaves which it produces. It rivals the most delicate Fern in the intense green and fineness of its leaves, which are produced in dense rounded masses, and have a graceful attractive appearance amongst flowering plants. Native of Britain, and succeeds in any soil.

CORNACEÆ.

The typical genus of this tribe is the only one comprised in it that contains any ornamental herbaceous species. *Cornus* is not an extensive genus, but is very diverse. The common Dogwood (*C. sanguinea*) is a familiar example of the tree or shrub section; and *C. canadensis* is the only worthy representative of the herb section, which comprises, so far as I am aware, only two species; the second one, *C. succica*, being a native of Britain, and not very ornamental, though often cultivated by lovers of curious alpine plants.

C. canadensis (*Canadian Cornel*).—Grows about 6 inches high, with unbranched herbaceous stems, having whorled leaves on short stalks, and little umbels of flowers accompanied by involucre of pretty white bracts suffused with purple. Flowers throughout summer and part of autumn. The plant is best adapted for culture on moist rockwork in sandy peat, and requires moderate shade and a cool situation. It is frequently cultivated in pots in frames, but is more interesting on rockwork, and should have no encroaching neighbours. Propagate by division.

CAPRIFOLIACEÆ.

Linnaea borealis (*Twin-flower*) is the only subject that this tribe offers for our selection. The genus comprises no other

species, and the order no other plant fit to associate with herbaceous or alpine plants. It is a pretty, graceful, fragrant plant, and the great name which it commemorates will add a special interest to those qualities in the minds of those who love botanical science, and revere the memory of the great Swede who was the first to unfold a method of comprehensively studying the vegetable kingdom and gaining an insight into its beauties. The plant is evergreen, with feeble, trailing, wiry stems, clothed with opposite broadly-oval leaves. The flowering branches are short, with a few pairs of leaves, and extend into long slender flower-stalks, each bearing a pair of pretty pink or white bell-shaped flowers appearing in summer. The flowers are fragrant towards evening. It is a native of fir woods in the north-east of Scotland, and has been found also in Northumberland ; but it is more common in alpine woods on the continent of Europe in the north, and in northern Asia and North America. When cultivated it is usually treated as a pot alpine, having been more easily kept in that way than in any other. It is not, however, so difficult to cultivate as is generally supposed. It grows best in rough fibry peat and sand, rambling over mossy stumps and roots and stones in moderately-moist partially-shady places. It flowers most freely when fairly exposed to the sun, but is not so easily kept alive and healthy in such circumstances ; and perhaps the best position for it to occupy would be that in which it would enjoy shade from the powerful rays of the mid-day sun only.

STELLATÆ.

This is an herbaceous tribe of the great natural order *Rubiaceæ*, which comprises the splendid genera *Ixora*, *Gardenia*, *Muscæda*, and many other stove and greenhouse species, more or less common in our gardens. Unfortunately, however, these shrubs and trees monopolise the beauty of the order to themselves, and leave to the herbaceous species very little to redeem them from the category of general weediness. There are, however, a few things that may be desirable in the collections of those whose taste and thoughts go deeper with regard to plants than the mere gratification afforded by profuse display of large or gaily-coloured flowers ; and there is one time-honoured plant in Woodruff, which cannot possibly be ignored in a book devoted to old-fashioned hardy garden-flowers.

Asperula odorata (*Woodruff*).—This is not a highly ornamental plant, but is nevertheless pleasing and attractive,—as much, perhaps, on account of its agreeable fragrance as its pretty white flowers, and the handsome arrangement of its fresh green leaves. It is not unworthy of a place in the mixed border; but its greatest value lies in the facility with which it establishes itself in shady places under trees, where little else will grow. Many a naked unsightly spot in woods may be clothed with a cheerful carpet of verdure by the free use of this pretty plant, and the considerable profusion of pure-white flowers which it produces in spring and early summer, in even the shadiest places, if not imposing, is quite enjoyable. So old an inhabitant of gardens scarce requires description. It may be freely increased by division in autumn, winter, or spring. Native of Britain and most countries of Europe and northern Asia.

Crucianella stylosa (*Long-styled C.*).—This is an ornamental member of an otherwise weedy group. It is a diffusely-tufted plant, with a profusion of weak, straggling, procumbent stems, clothed with whorls of six or more narrow lance-shaped leaves, acutely pointed, and otherwise rough to the touch from short bristly hairs. The flowers are produced in small but handsome terminal heads, and are bright rose or pink, with long styles protruding conspicuously beyond the corollas. Flowers from June to September. Height about 1 foot. Flourishes best in light, warm, sandy loam, but succeeds well in any ordinary garden-soil, and is worthy of a place in any collection of ornamental herbaceous plants. Increase by division in autumn, winter, or spring.

Houstonia.—This is a small genus of diminutive North American plants. They are simple, pretty, and interesting. They are adapted only for culture on rockwork among small alpine plants, for they should have no troublesome encroaching neighbours. They succeed best in moist sandy peat and loam, in warm positions. Propagate by division in spring; and the divisions will be more successful if first established in pots in a cold frame, or under a hand-glass for a time.

H. cærulea (*Blue H.*).—The plant forms dwarf rounded masses of small egg-shaped leaves, over which the tiny stems rise an inch or two, bearing small pretty flowers, with pale-blue four-lobed corollas, changing in age to white. Flowers from late spring till autumn. Height about 6 inches.

Mitchella repens (*Creeping M.*).—This forms flat close carpets of creeping, rooting stems, clothed with opposite pairs of broadly egg-shaped dark-green leaves, which are evergreen. In the axils are produced the small, white, rather long-tubed

flowers, which are succeeded by small red berries. It is a pleasing and characteristic plant on rockwork, and suitable only for that position. Flourishes best in moist sandy loam, in moderate shade. Height 3 or 4 inches. Native of North America.

Nertera depressa (*Flattened N.*)—This extremely curious and pretty plant—pretty as regards its fruit only—is of recent introduction. I have no experience of its culture, and can only say that it is recommended for culture amongst alpine on rockwork, in moist sandy loam. It forms densely-matted, dwarf, flattened tufts of creeping and freely-rooting stems, clothed with small, egg-shaped, somewhat succulent leaves, in the axils of which appear the small greenish flowers, which are followed by handsome small orange-coloured berries. Native of the mountains of New Zealand and Tasmania, and the Andes at high elevations throughout the greater part of the range.

VALERIANACEÆ.

This is an entirely herbaceous tribe, but does not comprise much that is floriculturally beautiful. *Centranthus ruber*, and one or two species of *Valeriana*, are handsome ornaments of herbaceous borders or the marginal borders of shrubberies, and several of the latter genus are proper subjects for naturalising in wild places about woods. Some that are specially adapted for the latter purpose, but suitable for no higher class of ornamentation, are : *V. officinalis*, with corymbose panicles of pink flowers, and growing about 3 feet high, and of which there is a white-flowered variety ; *V. Phu*, which is the spikenard of the Cretans, and grows to about 3 feet high, with white flowers ; and *V. pyrenaica*, having pink flowers and about the same stature. *V. sambucifolia*, which appears in some catalogues, is not very distinct from *officinalis*, and is by some held to be only a variety of that species: it has the same style and colour of inflorescence, and differs mainly in having the leaves divided into fewer and broader segments. They are bold, vigorous, encroaching plants that will hold their own against all neighbours, and that should be planted near nothing more valuable than themselves. The kinds enumerated all flower about the same time in early summer ; the flowers last a considerable time, and are followed by the pappus-like processes of the numerous calyces, which are interesting and graceful.

Centranthus ruber (*Red C.*)—This is a very handsome hardy

border-plant, and an old inhabitant of British gardens. It is originally from the Mediterranean, but having strayed from cultivation, and become naturalised in some parts of England and Ireland, it now finds a place in the British flora. There are two or three varieties—a white, a purple, and a red or crimson. Individual taste will guide in the selection of the colour; but it is necessary to state that neither the white nor the purple are good of their kind, nor can they be regarded as any improvement as regards effectiveness on the original red. The plant produces stout erect stems, rather woody at the base, and clothed with opposite, smooth, slightly glaucous, broadly-lance-shaped leaves, and terminating in bold handsome corymbs of numerous small flowers. It begins to bloom in June, and continues through the summer; and perhaps not the least beautiful feature, as it is certainly the most interesting one, is the elegant pappus-like calyx which adheres to the fruit in maturity. It is a very accommodating plant as regards culture, requiring only ordinary garden-soil, and occasional lifting and cutting in, without which it is apt to become weak and die out in the lapse of a few years. I have seen it planted and doing fairly well on the crumbling walls of an old ruin, and it is very useful for planting on dry rockwork, and in rocky stony banks where sufficient soil may be had to plant it in. Propagate by division in spring or autumn, and by cuttings of side shoots in autumn under a hand-glass or in a cold frame in sandy soil. Height about 2 feet.

Valeriana (*Valerian*).—Several species of this group have been already alluded to. Those following are, however, more choice plants, and deserving of more than passing notice, and a better position amongst ornamental plants. Propagate by division in autumn or spring.

Valeriana dioica (*Marsh Valerian*).—This is a distinct and pretty species. It has no bold or striking characteristics to recommend it to notice; it is a simple, lowly, creeping plant, throwing up many small corymbs of pink flowers to the height of 6 or 8 inches. The flowers begin to open in May, and last about two months. It is very useful for planting in marshy or wet ground, but succeeds well in any situation or soil; but in very dry soil it should, if possible, be planted in shade.

V. montana (*Mountain Valerian*).—This species grows from 9 inches to 1 foot high. The root-leaves are similar to those of the last; but the stem-leaves, which in that one are pinnate, in this are entire, and the corymbs of flowers are more compact. The flowers are pale red or pink, and appear in summer. Native of the Alps, Pyrenees, and Apennines.

DIPSACEÆ.

The most valuable genus in this tribe is *Morina*; and it is a choice and rather rare plant. In extensive collections of mixed ornamental and botanical subjects, one or two species of *Cephalaria* may be tolerated; but they are generally rather coarse plants, and not very long-lived perennials, requiring periodical attention in the matter of lifting and replanting in order to keep them vigorous. *Scabiosa* is the most numerous genus, and comprises a few handsome species; but the majority are either coarse or slightly ornamental, fit only at the most for naturalising on banks in half-kept parts of grounds.

Morina longifolia, syn. ***M. Wallichiana*** (*Long-leaved M.*).—This is one of the most beautiful of border-plants. It produces dense tufts of bright-green, wavy-margined, spine-toothed leaves, from 9 inches to 1 foot long, and 1 or 2 inches broad. The flower-stems are stout, erect, and about 18 inches or 2 feet high, clothed with shorter leaves, but otherwise the same as those of the roots, in the axils of which appear the handsome whorls of tubular, two-lipped, red-and-white flowers in July and onwards for a couple of months. The plant is accounted half-hardy, but is quite hardy in any part of the country. It is, however, impatient of wet stagnant soil, and assumes the biennial character in such very often. It flourishes best in light rich loam of considerable depth, being a deep tap-rooting plant. It ripens seeds pretty freely in many parts of the country, and may be easily kept in stock by means of these—sowing a few annually, or when requirements dictate, in spring, either in heat or in a cold frame in pots. Increase may be effected also by means of division in spring; but if doing well the plant should not often be disturbed, though when signs of weakness begin to show themselves in the centre of the tuft, it is advisable to lift and replant in fresh soil. Native of India.

Scabiosa (*Scabious*).—The Sweet Scabious, so well known as a border annual, is one of the best of this family; indeed none of the perennial species are equal to it in showiness, though a few are more neat and trim border-plants. They flourish best in light, rich, well-drained loam, and are easily increased by seed and division; and some shrubby or half-shrubby species may be increased by cuttings. I make but a small selection, but they are amongst the best of the species at present in cultivation.

S. agrestis (*Field Scabious*).—This species is nearly related to the British *S. Columbaria*. It forms tufts of slightly-divided

root-leaves and pinnate stem-leaves; the stems branching freely, and each branch ending in a considerable head of pale-purple flowers, appearing in July and August. Height about 18 inches or 2 feet. Native of Hungary.

S. graminifolia (*Grass-like Scabious*) grows about 1 foot high, producing tufts of handsome, very narrow, lance-shaped leaves, clothed with hoary down. The stems bear each a single pale-blue flower-head. They appear in June and July. Native of Switzerland.

S. Webbiana (*Webb's Scabious*).—This is a very dwarf species, producing short roundish root-leaves, wrinkled and hoary with down. The flowers are white, and appear in July and August. Height about 6 or 9 inches. Native of Mount Ida.

COMPOSITÆ.

This is a vast natural order. It is computed by De Candolle to comprise upwards of 9000 species, or about a twelfth part of the whole known vegetable kingdom. Of this immense number of forms there are upwards of 1000 in cultivation in botanic gardens in this country. The fine collection in the herbaceous department in Kew Gardens contained above that number of species of Composite plants fourteen years ago; and considerable additions will no doubt have been made since then, by the introduction of new species which explorations in various parts of the world have brought to light. In an order so extensive, there must, of course, be many worthless weedy plants, looked at from a floricultural point of view; but it cannot be but that there should also be a large number of beautiful subjects adapted to a great variety of purposes. The general impression, however, is, that the *Compositæ* are a horde of barbarians, which no sane gardener would admit within the boundaries of the refined circles of cultivated Flora; only a few, the Dahlia and a limited number of hardy and tender annuals, being thought worthy of that distinction, out of hundreds of species not inferior to many popular occupants of high places in flower-gardens at the present time. The *Compositæ* give us subjects beautiful and gay, of all aspects and many degrees of stature, and great variety of habit of growth. Yellow is the predominant colour, and white is abundant; blues and purples are more rare, and reds the rarest of any. There are many noble-foliaged plants, and odd and curious ones too, which are quite as eligible

subjects for foliage-gardening as many that are at present in use in that peculiar style.

Achillea (*Milfoil*).—This is rather an extensive genus, familiarly represented on the roadsides of most parts of Britain in the common Milfoil (*A. Millefolium*). A good many species are weedy and uninteresting, quite unfit for cultivation for ornament; but a few are excellent showy plants for borders or rockwork, and one or two may be considered first-class herbaceous plants; the best of them, however, are simply showy without much refinement, and their chief recommendation is their prolonged flowering period, which in some extends to five or six months. They flourish best in light, dry, rich soil, but will do very well in any ordinary garden-soil. Propagate by division.

A. Ageratum (*Sweet Maudlin*).—The plant grows about 2 or 3 feet high, producing oblong, blunt, smooth leaves, with sharply-toothed margins. The flower-stems are upright, and terminate in a crowded corymb of yellow flowers, appearing from July till September. Best adapted for culture in the mixed border or amongst dwarf shrubs. Native of the south of France and Italy.

A. aurea (*Golden Milfoil*).—This is a dwarf compact species forming flat masses of finely twice-pinnate leaves. The flower-stems are nearly erect, producing crowded flattened corymbs of golden flowers in summer and autumn. This is one of the prettiest of the dwarf Milfoils, and is adapted for the border or rockwork. Native of the Levant.

A. Clavennæ (*Silver-leaved A.*)—This is a dwarf species, with pinnatifid, hoary, downy leaves, and short erect flower-stems, terminating in umbel-like corymbs of white flowers, appearing in June and July. Height about 6 inches. The plant is quite as valuable on account of the foliage as the flowers. It makes a pretty object in the front lines of herbaceous borders and on rockwork, but is not so effective in bedding-out as many other hoary foliage plants in use for that style, though for variety's sake it may be desirable in some cases. Native of Austria.

A. Eupatorium (*Caspian A.*)—This is a gigantic species, reaching the height of 3 or more feet. The leaves are very deeply cut, but not pinnate, and clothed with hoary down. The corymbs are very large, flat, and bright yellow, and are produced in July and August. Native of the shores of the Caspian. This perhaps is the best and boldest of the large-growing species. In a mass it forms a striking object when viewed from a distance. It is useful for planting amongst low-

growing shrubs, to give colour to masses of green. It is too gross, however, for small gardens, but where wide herbaceous borders exist it is an excellent plant for back lines.

A. lingulata (*Tongue-leaved Sneezewort*).—This species produces tongue-shaped bluntly-pointed leaves, diminishing in width downwards, sharply toothed on the margins and downy, as are also the stems. The corymbs are dense, compact, and umbel-like, and the flowers, pure white, are produced in July and August. Height 9 inches to 1 foot. Native of Hungary. Suitable alike for border and rockwork.

A. Millefolium, fol. var. (*Variegated-leaved Milfoil*).—This is a pretty and desirable form of this common wayside plant. The finely-divided leaves are variegated with creamy-yellow colouring. It may never be very useful in the flower-garden as a bedding plant, but in the mixed border and rockwork it will be found pleasing and attractive.

A. Ptarmica flore-pleno (*Double-flowered Sneezewort*).—This is a handsome sort, growing about 1 foot or 18 inches high, with lance-shaped acute leaves, sharply toothed on the margins. The corymbs of flower are dense and white, and are produced from early summer till late autumn. Native of Britain.

A. tomentosa (*Woolly-leaved Milfoil*).—This is one of the handsomest of the dwarf species. It forms low close masses of delicately-divided densely-woolly leaves. The flower-stems rise to the height of from 6 to 12 inches, bearing corymbs of bright yellow flowers, which appear from May till late autumn. It is very handsome on rockwork or in the front lines of mixed borders. Native of the Alps.

Antennaria (*Cat's-ear*).—This is a genus of unpretending plants, mostly of very low stature, and having hoary or silvery grey foliage and everlasting flowers, which will be found useful for bouquets and general room decoration in winter, but for this purpose they are inferior in point of colour and size to many already in use. The dwarf species are very appropriate ornaments of rockwork and the marginal lines of beds and borders, and the last of the selected species has been used with good effect in the carpeting style of bedding-out. The taller species are rather straggling plants, and not very showy, though rather distinctive, and may be desirable where the space and collections are large. They flourish best in light sandy loam, rather dry than otherwise, and may be propagated by division in spring.

A. dioica (*Mountain Cat's-ear*).—This is a very dwarf species, producing slowly-extending procumbent rooting stems, clothing the ground with small, tongue-shaped, densely-woolly leaves

of a grey colour. The flowers are pink, borne a few heads together in small terminal corymbs on stalks 3 or 4 inches high. There are two varieties of this plant about in nurseries, one named *A. d. minima* and the other *A. d. hyperborea*. The first has no merits superior to those of the normal form, but is smaller in every way; and the other is rather larger, and perhaps more useful on this account. In nurseries and many gardens, and with some botanists, it is regarded as a species; but it appears to be only a slightly more vigorous form of *dioica*. All the varieties are found in Britain, and the species is besides a native of mountainous parts of central and southern Europe and northern Asia. Flowers in June and July.

A. margaritacea (*Pearl Cat's-ear*).—This is a tall species, reaching the height of 2 or 3 feet. The stems are weak and rather straggling, branching freely towards the top, and are clothed with narrow lance-shaped leaves, densely clothed with whitish down. The stems and branches terminate in compact corymbs of white flower-heads. Owing to the straggling habit of the plant, it cannot be considered a very ornamental subject; but the flowers, being a tolerably good white, are desirable for mixing with other everlastings. Originally the plant is from North America and central Asia, but has become sparingly naturalised in Monmouthshire and South Wales.

A. tomentosa (*Woolly Cat's-ear*).—This species is nearly allied to the Mountain Cat's-ear, having similar leaves and the same close low habit of growth; but the leaves are clothed with a denser and purer white down, giving the plant an interesting and attractive appearance. The flower-heads are white, and are best cut away when the foliage effects are the object of culture. Native of North America.

Arnica montana (*Mountain A.*)—This is, so far as I am aware, the only species of the genus in cultivation, and perhaps the only one in nature, though the genus is sometimes augmented by including some of the species of *Aronicum*, which for all ornamental purposes may be very well allowed, as they are nearly related and resemble each other in the style of the flowers and habit of growth. The present species is a low-growing plant, producing tufts of egg-shaped entire leaves. The flower-stems rise about 9 inches high, supporting large deep-yellow flower-heads, with spreading rays. It is adapted to culture on either the rockwork or front of mixed borders, in light, rich, well-drained loam, and is a handsome object in either situation. Flowers in June and July. Native of open woods and pasture on hills in central Europe.

Aronicum.—This is a genus of few species, two of which

are in cultivation. They are dwarf handsome plants, with very large conspicuous flowers, and are suitable for either rock-work or border, in light, sandy, moderately rich, but well-drained soil. Propagate by division.

A. glaciale (*Glacier A.*)—This plant grows from 6 to 9 inches high, producing rigid, oblong, shortly-stalked leaves, and very large bright yellow flower-heads, one to a stem, appearing in July and August. Native of the loftiest positions on the Alps, inhabiting moraines.

A. scorpioides (*Mountain A.*)—This species grows about 1 foot high, with broadly-egg-shaped leaves, and produces very large orange or deep-yellow flower-heads, one to a stem, in June and July. It inhabits similar positions with the last, but not usually ascending to such frigid heights, and is the more handsome of the two.

Aster (*Star-wort*).—The species of this very extensive group are popularly named Michaelmas and Christmas Daisies, on account of the lateness of their flowering period, and a resemblance which the flower-heads of some of the species have to those of the Daisy. There are perhaps 70 or 80 species of Star-worts in cultivation in botanic gardens in this country, and in some nurseries are to be found a few of the best; but they have generally been long banished from private gardens—or if about them at all, they are huddled up in some out-of-the-way place, where they do no good, nor have any chance of doing good. We have not many more useful plants. Many of them are deficient in tidiness of habit; many, also, are far from possessing ornamental flowers, and for this latter reason should not be afforded room in any but botanical gardens; but the first-named defect should have very little weight against the profusion of gaily-coloured flower-heads which many species produce at so little expense and trouble up till the end of the year. Flora has few gifts to bestow in open-air productions at Christmas-time in our climate, and such as she gives in this genus are not to be compared with those of more favoured seasons; but they are the best of their time, and very useful; and if we decline them on the score of the ungainly habit of some of them, we will hardly be able to clear ourselves from the accusation of fastidiousness, for we spare no trouble with equally unhandsome and not more useful things at times when there is less reason to do so. They are plants of the most easy cultural requirements, flourishing best in light, dry, sandy soil, in sunny, warm positions. All may be grown in beds or borders, or amongst shrubs; and for many of the taller and more straggling species there could be no more fitting position than the

latter, as much of their legginess will be concealed by the shrubs. There are a few species fitted for rockwork, though by no means requiring that position, as they do equally well on the ground surface. The few selected species embrace some of the best and most distinct, but they do not exhaust the number of ornamental plants comprised in the group.

A. alpinus (*Alpine Star-wort*).—This is a neat dwarf plant, about 9 inches high. The leaves are broadly lance-shaped, increasing in width somewhat towards the points. The flower-heads, on short stems singly, are large and spreading, pale purplish-blue. Native of mountain pastures on the Alps and Pyrenees. Flowers from May till August. A handsome border or rock plant. There is a handsome white-flowered variety, not nearly so plentiful, named *A. a. albus*.

A. amellus (*Italian Star-wort*).—This species grows about 2 feet high, with erect, rather rigid stems, generally unbranched till near the top, when they break out into the few-flowered corymbs. The leaves are oblong, lance-shaped, and slightly rough, with stout short hairs. The flower-heads are produced in an irregular open corymb, are pale blue, and appear in August, September, and October. Native of mountain pastures in central and southern Europe. An excellent border-plant.

A. discolor, *syns. A. versicolor and A. bicolor* (*Two-coloured Star-wort*).—This plant grows about 18 inches high, in neat compact style. The leaves are broadly lance-shaped and slightly toothed. The flower-heads are white and reddish purple, and are produced in open corymbs, appearing in August and September. Native of North America. This is one of the best of the species, and is an excellent mixed-border ornament.

A. elegans (*Elegant Star-wort*).—This species grows about 2 feet high, in rather graceful, freely-branching habit. The leaves are oblong or lance-shaped, and slightly rough to the touch. The flower-heads are not of the largest, but they are most profuse in graceful open panicles, and are bright blue or purple. Flowers from August onwards for a month or two.

A. ericoides (*Heath-leaved Star-wort*).—This is a tall, rather straggling plant, about 3 feet high, but withal graceful. The leaves on the upper part of the stems are very narrow and awl-shaped, and being very numerous and closely packed, the branches become not unlike those of some of the heaths. The flower-heads are small individually, but very numerous in open graceful panicles, and are white. Flowers in September and October. Native of North America. The plant is well worth a place in back lines of mixed borders, and may be used with excellent results amongst masses of shrubs.

A. grandiflorus (*Large-flowered Star-wort*).—This species grows about 2 or 3 feet high. The leaves are narrow, lance-shaped, those on the higher parts of the stems being reflexed. Flower-heads very large, with widespread purple rays, appearing from October on till Christmas. It flowers too late to be of much use in the north or other cold localities in ordinary circumstances; but planted at the foot of a wall with a south exposure, it will bloom right on to the end of the year. Native of North America.

A. lævis (*Shining-leaved Star-wort*).—The plant grows about 2 feet high, producing oblong, smooth, shining leaves, and moderately-dense corymbs of bright blue flowers, in September and October. Native of North America, and suitable for border or shrubbery decoration.

A. novæ angliæ (*New England Star-wort*).—This is one of the finest of Star-worts as regards the profusion and showiness of its inflorescence, but is rather straggling and top-heavy. It grows 4 or 5 feet high. The leaves are narrow, lance-shaped, slightly hairy, and stem clasping. The corymbs are great and clustered, and the flower-heads are comparatively large and reddish purple. They appear in September, and last for two months. Native of North America.

A. novi belgii (*New York Star-wort*).—This species is about the same in stature as the last. The leaves are lance-shaped, undivided, and smooth. The flower-heads are blue, and produced in open corymbs, in September and October. Native of North America.

A. patens (*Spreading Star-wort*).—This species grows about 18 inches high, in open, spreading, rather graceful style. The leaves are oblong, lance-shaped, and fringed with hairs, stalkless, and slightly clasping the stem with their base. The panicles are open and spreading, and the flower-heads are deep purple, appearing from September onwards. Native of North America.

A. sericeus (*Silky-leaved Star-wort*).—This is a very distinct and pretty plant, growing 2 or 3 feet high. The stems are somewhat shrubby, and are clothed with stalkless, broadly-egg-shaped leaves, which are coated with silky down. The flower-heads are large and solitary at the ends of the branches; they are blue, and appear in summer, autumn, and early winter. The plant is doubtfully hardy, but endures the winters of the south of England with impunity. It is worth the protection of a wall in Scotland and in other cold localities. Native of North America.

A. turbinellus.—This is a tall species, 3 or more feet high,

producing numerous much-branched stems, clothed with smooth lance-shaped leaves. The flower-heads are produced in open spreading corymbs in immense profusion, and are dark blue or purple blue. Native of North America. Flowers in September and October.

Bellis perennis (*the Daisy*).—It would be an act of temerity to introduce the common Daisy as an ornamental herbaceous plant, to which I shall not commit myself; and yet, were it not that we, as cultivators, are called upon to wage constant warfare against it as a weed, our eyes might not be so unwilling to recognise the intrinsic beauty of the “wee, modest, crimson-tipped flower” that gave inspiration to Scotland’s sweetest singer. There is a group, however, of beautiful double varieties of the Daisy, which is unquestionably worthy of culture amongst the choicest of hardy border perennials. In the eyes of the florist they are great improvements on their too common parent, but the poet would miss in them the modesty that charmed him in it. There are a good many varieties of these pretty lowly flowers in cultivation. There are white, purplish, pink, and crimson sorts; some are variegated in flowers, and others in foliage; and there are one or two crowned sorts in which the centre and circumference are in different colours; and the curious proliferous variety, or Hen-and-Chicken Daisy, is not the least interesting of the group. The elegant variegated-leaved sort, which in catalogues is named *aucubæfolia*, is worthy of special remark. The leaves are blotched and veined with yellow. In heavy wet soils it is not easily kept in winter, and is apt to run green. In such soils it should be lifted on the approach of winter, and stored in pots in a cold frame. All the double Daisies are fit ornaments of the mixed border and the rockwork, and are invaluable edgings to paths and beds in cottage gardens; and their early free-flowering character has brought them recently into repute as spring-bedding plants. In whatever way they may be used, they should be annually lifted and relaid or planted in fresh soil; or if not new—that is, if they must be planted in the same position—it should be well dug, and a little manure given. Propagate by division at any time during the growing season.

Bupthalmum salicifolium (*Willow-leaved Ox-Eye*).—This is a very showy plant. It produces masses of narrow, lance-shaped leaves, slightly downy. The stems are erect and clothed with leaves, and bear large bright yellow flowers, with broad-spreading rays. Flowers in July, August, and September. Native of upland pastures and bushy places in Austria, Switzerland, and southern Italy. It is an excellent

mixed-border plant, and succeeds well in any ordinary garden-soil. Propagate by division.

Coreopsis (*Bug-Nut*).—A considerable genus, but of which there are few in cultivation—a fact the less to be regretted, because they are nearly all the same in colour; and their foliage being only of secondary account in estimating their value as ornamental plants, one or two representatives will be considered quite enough in any but botanical collections. They succeed in any good garden-soil, and are increased by division, and are fitted only for border or shrubbery decoration.

C. auriculata (*Eared-leaved Bug-Nut*).—A rather tall plant, and somewhat straggling, producing 3-lobed root-leaves, the lateral lobes, suggesting the fitness of the specific name, being comparatively small, and bearing some such relationship to the central lobe as the ears of an animal to the head. The stem-leaves are undivided and thinly scattered. The flower-heads are large, with a spreading yellow ray, appearing from August to October. Native of North America.

C. lanceolata, syn. **C. grandiflora** (*Lance-leaved Bug-Nut*).—In this species the root and stem leaves are the same in shape, but the latter diminish in size as they ascend the stems, and all are slightly fringed with hairs. The flowers are yellow, of the same character as the last, and appear in summer and autumn. Native of North America.

C. tenuifolia (*Fine-leaved Bug-Nut*).—A very distinct plant from either of the two preceding. It grows about 2 feet high, with weak rather straggling stems, and produces much and finely-divided leaves and bright yellow flower-heads, rather smaller but not less handsome than the last. Flowers in July and August. Native of North America.

Doronicum (*Leopard's-Bane*).—This is not an unfamiliar genus, the Great Leopard's-Bane being often seen in cottage gardens and in woods in the neighbourhood of larger ones in many parts of Britain. It is usually regarded as a weedy or coarse genus; and rather coarse it undoubtedly is, and has some of the encroaching intrusive habits of weeds; but the species are all more or less showy, and their robust accommodating nature renders them most useful for introducing colour into woodlands where that is an object. They thrive in any soil, wet or dry, and increase and extend themselves irresistibly in any position. I have seen the Great Leopard's-Bane clothing steep banks in shady woods with very little soil to hold by; and such as there was, was in a state of perpetual ooze, and it grew and flowered as well there as it did elsewhere in better circumstances. They are spring-flowering plants, and on this

account one or two of the species have been recommended for spring bedding. Their general coarseness would be rather too loud and striking, associated closely with the majority of spring flowers; but there is no reason why they may not be used in connection with the spring flower-garden as groups in the background. Propagate by division.

D. caucasicum (*Smaller Leopard's-Bane*).—The plant grows about 6 or 9 inches high, producing dense tufts of roundish egg-shaped leaves, heart-shaped at the base, and toothed and hairy. Flower-stems simple, bearing one large flower-head each, bright yellow, with a widespreading ray. Native of the Caucasus, Naples, Sicily, and other countries of southern and central Europe. This is one of the least coarse of the group, and is well adapted for naturalising in shady places, and may be used in the spring flower-garden without the objection of coarseness that attaches to the larger kinds. Flowers in May, continuing some time into summer.

D. Pardalianches (*Great Leopard's-Bane*).—This species forms massive tufts of leaves that are broadly heart-shaped, softly hairy, and openly toothed. The stems rise about 2 feet high, are leafy, and terminate in several large spreading bright yellow flower-heads, appearing in May and June. Native of Britain as a naturalised plant, but originally it is from central Europe.

There are several other species of Leopard's-Bane in cultivation, but the two above described embrace more or less between them the characters of the others. *D. altaicum*, a white-flowered species not in cultivation, is worthy of being introduced.

Erigeron.—This genus comprises a few handsome border species. They are mostly profuse-flowering plants with purple or blue coloured flower-heads. There are about twenty species in cultivation, but a good many of them are very near each other in their general appearance, so that a small selection may be made to embrace all that it would be desirable to have in a collection of distinct ornamental plants. They thrive well in any garden-soil, and are easily propagated by division in spring. Although more specially adapted to border ornamentation, one or two species are very fit subjects for the rockwork, and will be pointed out in their proper place.

E. alpinus (*Alpine E.*).—This is a dwarf plant forming neat tufts rarely exceeding 9 inches in height. The leaves are lance-shaped and somewhat hairy, and fringed with hairs, but entire on the margins. Flower-stems usually simple and one-flowered, but not unfrequently in rich soil producing several flower-heads. The flower-heads are large, with widespread narrow ray florets,

and they are either pink or purplish, and produced in July and August. Native of mountain pastures in Scotland and the Alps. There is a larger-flowered variety, in which the flower-heads, twice the size of those of the species, are more showy. It is in nurseries under the name *E. grandiflorus*—more properly it should be *E. a. var. grandiflorus*. Both the species and the variety have at first sight some resemblance to *Aster alpinus*; but on closer examination they will be found to differ in many not inconsiderable points, and the flowering period of the latter is much longer. The Alpine *E.* is very well adapted to culture on rockwork.

E. glabellus (*Smooth-leaved E.*)—This species grows about 1 foot or 18 inches high, with smooth narrow leaves clothing the stems. The stems terminate in a corymb of few flower-heads. The flowers are blue, and appear in July and August. Native of North America. One of the best of the taller species, and best fitted for the mixed border.

E. Roylei (*Royle's E.*)—A very dwarf and beautiful species, reaching the height of only 3 or 4 inches. It is very near in character to the Alpine *E.*, but the flower-heads are larger and paler purple, and the plant is altogether more rigid and dwarf. Flowers in early summer. Native of the Himalayas. Suitable alike well for rockwork and the front lines of mixed borders.

E. Villarsii (*Villars's E.*)—This species grows about 1 foot or 18 inches high, with erect leafy stems. The leaves are lance-shaped, slightly toothed, and rather rough to the touch. The flower-heads are in panicles, not so large as some of the preceding, nor very numerous, but very effective reddish purple. Native of upland pastures on the Alps. Flowers in July and August.

Echinacea.—This is a bold showy group of plants producing very large flower-heads, and in all species they are gaily coloured. They are adapted only for border culture, and introducing amongst dwarf shrubs. They succeed in any common garden-soil, and are easily increased by division in autumn or spring.

E. angustifolia (*Narrow-leaved E.*)—This species is of comparatively recent introduction. It grows 3 or 4 feet high, producing narrow lance-shaped leaves. The flower-heads are large, and the ray is large, and composed of numerous narrow, spreading, red or purplish florets, appearing in July and lasting a month or two. Native of North America.

E. intermedia, syn. **Rudbeckia intermedia** (*Intermediate E.*)—This is a hybrid between the species immediately following and the last one. It partakes of the character of both

species, but will be considered more showy than either. The flower-heads are purple, very large, and appear in July and August.

E. purpurea, syn. **Rudbeckia purpurea** (*Purple E.*)—This species grows 4 or more feet high. The leaves are broadly lance-shaped or egg-shaped. The flower-heads are large, with long, rather flaccid, and drooping purple rays. Flowers in July and August. Native of North America.

E. serotina, syn. **Rudbeckia serotina** (*Late-flowering E.*)—This species grows about 3 feet high. The leaves are broadly egg-shaped and slightly toothed. The flower-heads are large, and the purplish-red ray florets are stiffly spreading. They appear in August and September. Native of North America.

Echinops (*Globe Thistle*).—This is a coarse but very striking genus of Thistle-like plants, with large globular flower-heads and great hoary leaves, which are quite as worthy the attention of those who practise what is named subtropical gardening as many farther-fetched things. But I do not put them forward here for that purpose. They are mostly natives of woody or bushy places in the south of Europe and the Levant, and are adapted generally for naturalising in similar situations in Britain. They are stiff rigid plants, with a rather touch-me-not air about them, which gives them a desirable character for naturalising in half-kept places. They succeed in any garden-soil, but best in that which is rather rough and stony. Propagate by division in spring.

E. Ritro (*Smaller Globe Thistle*).—This species is the most fit of any of the group for culture in the mixed border. It grows from 2 to 3 feet high, branching freely, the stems and branches being clothed with large pinnatifid leaves, clothed with cottony down beneath, and webbed above with the same. The heads of flowers are globose and purplish blue. They appear in summer and autumn. Native of southern Europe.

E. ruthenicus (*Russian Globe Thistle*).—This species grows about the same height as the last. The flower-heads are similar in character, but the leaves terminate in stout spines, as do also the lobes of the upper leaves. Flower-heads blue, appearing in June, July, and August. Native of Sicily and other countries of southern Europe and Russian Asia.

E. sphaerocephalus (*Round-headed Globe Thistle*).—This plant grows 5 or 6 feet high in rich soil, branching freely. The leaves are large, pinnatifid, densely clothed with cottony down below, and above with slightly glutinous hairs. The flower-heads are very numerous, quite spherical, and pale blue, appearing in July and August.

Gaillardia.—This is a limited group of handsome border-plants, producing large showy flowers, rather profusely and in long continuance. They require rather a dry warm situation and rich light loam, as they are apt to perish in heavy soils in cold wet places. Where they are apt to die in winter they may yet be used in mixed borders, treated as half-hardy annuals; for if sown in a mild hotbed in the end of February or the beginning of March, they may be grown into good plants, and a full display of their fine flower-heads obtained as early as upon those which may have withstood the winter in the borders. They are propagated by cuttings in autumn or spring in the manner of general bedding plants, and by division in spring, assisted afterwards by slight heat if the locality is a cold one.

G. aristata (*Awne'd G.*)—This species grows 1 foot or rather more high, producing very freely large flower-heads, orange yellow in colour, in July and onwards till October. Native of North America. One of the hardiest of the group.

G. grandiflora, **G. maxima**, and **G. Loeselii**, are all forms of the same plant. The last is perhaps the best or most showy. It grows 3 or 4 feet high, producing very large flower-heads, coloured crimson and yellow. They appear in July, August, and September.

G. Richardsoni (*Richardson's G.*)—This sort grows 18 inches or 2 feet high. The flower-heads are orange and large, and are produced throughout the greater part of summer and autumn. Native of North America, and one of the hardiest.

Galatella.—This genus is an offshoot of the extensive Starwort group, and the few species of which it is composed bear considerable resemblance to some of those comprised in that group. *G. hyssopifolia* is perhaps the most ornamental of the four or five species that have been taken from Aster, and grouped together under this name; and as the general character, at least for the purpose of the gardener, is the same as that of Aster, it only need be described here. The others are quite worthy of cultivation in extensive collections, and their names may be noted now for the use of those who may wish to add them to their collections. They are all in nurseries under the name Aster or Galatella, but more commonly they are named Aster.

G. hyssopifolia (*Hyssop-leaved G.*)—This plant grows about 1 foot or 18 inches high, erect at first, but the slender stems, as the development of the corymb of flowers proceeds, become gradually bent downwards. The leaves are very narrow, linear, and roughish to the touch. The corymbs of flower

heads are dense and somewhat pyramidal in outline. The flower-heads are lilac or pale purple, and appear in September and October, often also in November if the weather is mild. Native of North America. This species and the others are easily-cultivated plants, succeeding well in any ordinary garden-soil, and are suitable for the mixed border and shrubby borders. The other species known to cultivation are *G. linifolia*, *G. punctata*, and *G. dracunculoides*.

Grindelia.—This is a showy genus well worthy of culture wherever the climate and soil are favourable, but in this country they do not endure our winters, except in dry, warm, well-sheltered places. They flower very freely, and keep up a long succession of bloom, and their character and style are well worth trying for wherever the climate is suitable. I cannot, however, recommend them for any part of Scotland or the north of England, having had no experience of them in either of these quarters. It is a small group, and all that are known to science are not in cultivation; and some of those that are, are dwarf half-shrubby plants, more suitable for planting at the base of a wall than in the open border, and are quite worthy of such a position where there is room for them. Two of the herbaceous species only will be noticed; they are both in cultivation, and to be had in nurseries, though they are rare. They are the hardiest of the group, and succeed well in the London district and beyond it southwards, and in Ireland. They flourish best in light rich loam. Propagate by division in spring.

G. grandiflora (*Large-flowered G.*)—The plant grows 3 or 4 feet high, with undivided stems till near the top, when they branch for flowering. The leaves are stalkless, clasping the stems somewhat at the base, roughly toothed on the margin, and tapering much from base to point. The flower-heads are borne one on each branch, and are large, with spreading bright orange-yellow ray-florets. Flowers from July till late autumn. Native of Texas.

G. squarrosa (*Snake's-head G.*)—This species grows 1½ to 2½ feet high, with unbranched stems till near the top, where they break for flowering. The leaves are lance-shaped, clasping the stem slightly at the base, and coarsely but sharply toothed. Flower as in the last species, only one to a branch. They appear in July and continue till September. Native of Missouri.

Helianthus (*Sunflower*).—This is rather a coarse but showy genus, embracing a considerable number of species of tall striking plants, all producing yellow flower-heads. Any of the species may be freely naturalised in open woods and semi-

wild places ; and a very limited selection may be made in favour of the mixed border where the borders are of ample breadth, but scarcely any of them are suitable for those that are narrow. They are all very suitable for planting amongst open shrubberies for the purpose of giving colour to masses of green, and the dwarfest of the species may be planted in masses by themselves, or in association with other plants of different colours and similar habit, in points of landscape where it is desirable to have the distant effects of colour. They succeed well in any fairly good soil, and being robust, vigorous plants, may be established at very little cost or trouble in almost any place where there is tolerable depth of soil. Propagate by division in autumn or spring. It may be observed that rabbits are exceedingly fond of the young growth, and where they abound it will therefore be difficult to naturalise these plants without giving them necessary protection.

H. angustifolius (*Narrow-leaved S.*)—This species grows about 3 feet high, with slender unbranched stems, clothed with opposite narrow lance-shaped leaves, rough to the touch, entire on the margin, but revolute. Flower-heads yellow, terminating the stems, which in established plants are numerous. Flowers in August, September, and October. Native of North America.

H. doronicoides (*Leopard's Bane-like S.*)—This species produces rather slender stems, about 3 or 4 feet high. The leaves are opposite on short stalks, egg-shaped, with a slightly glaucous tint on the upper side. Flower-heads large, bright yellow, with wide-spreading ray-florets. Flowers in July and the two following months. Native of North America.

H. multiflorus (*Many-flowered S.*)—This species grows about the height of the last two, but with stouter and more erect stems. The leaves are heart-shaped or egg-shaped, and very rough to the touch. The flower-heads are large, deep yellow, and the ray-florets are very numerous and spreading. Flowers in August, September, and October. Native of North America. There is a very handsome double variety in nurseries under the name *H. multiflorus plenus*; it is more ornamental than the normal form. These are three of the best suited for border decoration ; but there are others not inferior, and many besides that are too bulky for ordinary border ornamentation, though producing showy flowers in considerable abundance. The following is a short list of some of the more distinct for naturalising : *H. excelsus*, 6 to 8 feet ; *H. macrophyllus*, 5 feet ; *H. diffusus*, 4 feet ; *H. Maximiliani*, 4 feet ; *H. orgyalis*, 5 feet.

Helenium.—This is a limited genus of North American

plants, of which we have very few in cultivation. Two or three of the species that are to be found in botanical gardens are scarcely hardy enough to endure out of doors our winter climate, and they are not so highly ornamental as to repay the trouble of protection. The two selected are quite hardy, and will succeed in any ordinary garden-soil. Propagate by division in autumn or spring.

H. autumnale (*Autumn-flowering H.*)—This species grows about 3 feet high. The flower-heads are very large, bright yellow, with broad-spreading ray-florets, appearing from August till October. The variety *H. a. pumila*, growing about 18 inches or 2 feet high, is a neater plant for small borders, and the normal form is handsome for larger ones and for shrubby decoration. Native of North America.

H. Hoopesii (*Hoopes's H.*)—This is a species of recent introduction, for which we are indebted to Mr Thompson of Ipswich. It grows about 2 feet high, and produces large flower-heads, deep-yellow or orange colour. Flowers in June, and onwards throughout the summer. It is a very handsome border-plant, the best perhaps of the genus. Native of North America.

Hieracium aurantiacum (*Orange Hawkweed*).—The family of Hawkweeds is very extensive, and very generally rather weedy. The species above named is, so far as I am aware, the most ornamental. It is well worth a place in mixed borders where the collection is extensive, being rather a showy plant, though never very profuse; but for four or five months it is always throwing up its corymbs of deep orange-coloured flower-heads. It produces dwarf tufts of entire hairy leaves, whence spring the rather hairy slender flower-scapes, bearing compact corymbs of flower-heads. It is a common plant in cultivation, being often met with in cottage gardens. It flourishes in any ordinary garden-soil, and may be freely propagated by division in autumn, winter, or spring. Native of the mountains of southern Europe, and occasionally found as an escape from gardens in many parts of Britain, and so included in some of our British floras. Height about 18 inches.

Liatris.—This is a very handsome family of hardy border-plants from North America, one or more of which should be in every collection. Only one species is at all common, *L. spicata*, and it is not so generally grown as it should be on account of its fine habit and beautiful spikes of flower-heads. There are about ten species in cultivation; but very few of these are in nurseries, and fewer still in private gardens. All are purple-flowered, and late summer and autumn flowering

plants, so that a small selection will suffice to embrace the cream of them. They succeed best in light, rich, sandy loam, rather dry than otherwise, and may be propagated by division in autumn or spring.

L. elegans (*Elegant L.*)—This species grows about 2 feet high. The stems are stout and leafy and hairy, terminating in handsome spikes of pale-purple flower-heads, 1 foot or more in length. The leaves are narrow, lance-shaped, rough to the touch, and dotted. The scales of the involucre are hairy. Flowers in July and the two following months.

L. pycnostachya (*Dense-spiked L.*)—This species grows from 2 to 3 feet high. The leaves are narrow, linear, and downy. The spikes are long, and often divided into lateral spikes of shorter length. The flower-heads small, but densely clustered in the axils of the leaves. Flowers deep purple, appearing in August and two following months.

L. scariosa (*Membranous-scaled L.*)—The stems of this species rise about 3 feet high, and are hairy. The leaves are lance-shaped, destitute of hairs, but roughish on the margin. The spikes are irregular, and not so long as in either of the preceding, as compared with the height of the plant; but the flower-heads are large, and are pale purple. They appear in autumn.

L. spicata (*Spiked L.*)—This is one of the handsomest and neatest of the species, and at all times while in growth it is a dressy and attractive border-plant. It grows 1 foot or 2 feet high, with erect leafy stems. The leaves are lance-shaped, destitute of hairs, but slightly fringed on the margin about half their length. Spikes long, the flower-heads stalkless, bright purple, and closely arranged on the stems. Flowers in July and two succeeding months.

Linosyris vulgaris, syn. **Chrysocoma Linosyris** (*Goldilocks*).—This plant resembles in habit some of the Galatellas, but is easily distinguished from any of them by the colour of the flowers, which are yellow, and by other more scientific but obvious features. The plant grows about 1 foot high, with elegant numerous stems, clothed with linear leaves, dark green and dotted. The flower-heads are bright yellow, in terminal corymbs, which appear in August and continue till November. It is a handsome border-plant, and flowering so late, is a valuable and desirable peculiarity. Native of Europe and the Caucasus, and a rather rare native also of Britain. It is perfectly hardy, and succeeds in any ordinary garden-soil. Propagate by division in autumn or spring.

Othonna cheirifolia (*Stock-leaved Ragwort*).—This is the only tolerably hardy species of this genus, which is composed

of a good many half-shrubby plants incapable of enduring our winter climate. This is not a very ornamental subject, but it is very distinct in foliage, and in the warmer parts of the country will be found useful for introducing into dry warm banks in semi-wild places, where its creeping, suffruticose, freely-rooting stems would soon establish themselves. The plant grows about 18 inches or 2 feet high. The leaves are oblong, lance-shaped, somewhat glaucous, and evergreen. The flowers are thinly produced and yellow, but not very ornamental. Succeeds best in light sandy soil, well drained. Propagate by cuttings or division of the creeping-stems in autumn and spring. The plant should be tried out with caution in the north, or in cold wet places in any part of the country. Native of Barbary.

Pascalía glauca (*Glaucous-leaved P.*)—This, so far as I know, is the only species comprised in this name. It is a pretty and free-flowering plant, about 2 feet high, with broadly-lance-shaped leaves, slightly toothed on the margin and glaucous on the upper side. The stems divide near the top, and each branch terminates in a large deep-yellow flower. I have no experience of the plant north of London; it is perfectly hardy in that neighbourhood, but may require protection in colder localities. Succeeds well in light, rich, well-drained sandy loam. Propagate by division in spring. Flowers in summer and early autumn. Native of Chili.

Pyrethrum (*Feverfew*).—This is one of the most ornamental genera of this great family. The flower-gardener's interest is, however, centred in the varieties of two of the species, and they are a host in themselves. Salter's varieties of *P. roseum* are very numerous, various, and beautiful, embracing amongst them many shades of colour—white, rose, red, and crimson, in varied tints; and some varieties are distinguished by combinations of those colours, either shading into each other, or arranged in distinct zones. They are beautiful also in form, very generally having a high quilled centre, in the way of and equally perfect as the globe-quilled China Asters, but usually fringed with broad ray-florets. Their great beauty and free-flowering qualities, and their simple culture, must make them great favourites with all ere long, but as yet they are not so generally cultivated as they deserve. They are particularly commendable to cottagers and other amateurs having limited and imperfect appliances, as their culture and propagation require no other facilities than those required by the hardiest border-plants. They are benefited by periodical removals and division, and by being annually refreshed by a surface-dressing of rich compost; and in droughty soil ample supplies of water will be

necessary, in order to prolong the blooming period. Very good showy varieties may be had cheaply by procuring a packet of seed of double varieties, which should be sown in spring; if early—say February or March—in a slight hotbed; or if in April or May, in a cold frame, or under a hand-light in pots. The plants will require to be pricked off as early as they can be handled, keeping a close atmosphere about them till they begin to root, afterwards inuring them to the fullest exposure of air by degrees, preparatory to transferring them to their final quarters. Propagate good fixed varieties by division, or by cuttings. The latter may be had early in autumn by cutting down the flower-stems before they have acquired too much hardness, and dividing them into lengths of two or three joints, cutting close and clean over by the lowest joint. They may be afterwards treated as Pink or *Lychnis* cuttings; but propagation by this means is more troublesome and less successful than that by division, which will be found usually sufficient for all ordinary demands.

P. alpinum, *syns. Leucanthemum and Chrysanthemum alpinum* (*Alpine Feverfew*).—The whole plant does not exceed 6 inches high. The root-leaves are deeply and regularly pinatifid; those of the flower-stems are linear and undivided. The flower-heads are white, large as compared with the plant, one to each stem. They appear in July and August. There is a variety with densely downy and somewhat hoary leaves and stems, named *P. alp. pubescens*, suitable alike for the rock-work and mixed border in dry warm soils. Propagate by division. Native of the Swiss Alps.

P. Parthenium (*Feverfew*).—Were it not for several varieties of this species, I should not notice it here, for the normal state of the plant is of no ornamental value; but the beauty of the double-white and the yellow-leaved varieties cannot be ignored. Indeed the latter, under the name Golden Feather, is yet a sensation-plant in bedding out, and in strong moist soil is likely to continue a favourite with all classes of flower-gardeners. The double-white Feverfew and Golden Feather, it is well enough known, may be propagated by division and by cuttings; and seed also may be resorted to with certainty of having each variety pure in its kind, if the seed is saved from good stock. Both varieties are fine border-plants, and they are good and also inexpensive subjects for bedding out. The species is a native of Britain and other countries of Europe. Flowers throughout summer and autumn. Height of the best dwarf kinds about 1 foot or 18 inches, coarser sorts 2 feet or more, Golden Feather about 9 inches.

P. roseum, syn. **Chrysanthemum coccineum** (*Rose-coloured Feverfew*).—As already stated, this is the parent of a numerous race of beautiful varieties that is yearly increasing in numbers and diversity. The plant grows about 1 or 1½ foot high, producing masses of handsome pinnate leaves, the leaflets being deeply cut and toothed. The flowers are large, with wide-spreading ray-florets, bright pink, and appearing in July and the two following months. Native of the Caucasus. It would be beside the purpose of this book to make any enumeration of varieties so trivial as the progeny of this species are. They are quite in the category of florists' flowers now, and any list that might be given at present would in all probability be superseded next year by more recent kinds; and besides, they are enumerated and described fully in lists easily obtainable from the dealers in such things.

P. uliginosum (*Marsh Feverfew*).—This is a handsome, free-blooming border-plant. The stems reach the height of about 18 inches, branching freely at the top. The flower-heads are large, white, and appear in July and two succeeding months. The leaves are lance-shaped, and deeply and sharply toothed. Native of Hungary.

Rudbeckia.—This is a handsome group of border-plants. Most of the species are bold-growing plants, producing large, showy, yellow flower-heads, with broad, spreading ray-florets. They are most easy to cultivate, flourishing in any ordinary garden-soil, but growing and flowering best in that which is moderately rich, light, and well drained. Propagate by division in autumn or spring.

R. hirta.—This plant grows about 2 feet high, with erect stems terminating in large yellow flower-heads, the ray-florets spreading, and sharply toothed at the ends. The leaves are broadly egg-shaped, hairy, and toothed, but otherwise entire. Flowers in July, August, and September. Native of North America. This is one of the showiest and most compact of the genus. There is a form with variegated leaves in cultivation, the leaves being blotched with creamy yellow.

R. laciniata (*Jagged-leaved R.*).—This species grows 3 or 4 feet high, with rather bold, coarse habit, but large, showy flowers. The leaves are roughly pinnate, the leaflets usually lobed and toothed. The flower-heads are large, deep yellow, and appear in July and the two following months. Native of North America. There is a variegated form of this species.

R. Newmanni, syn. **Centrocapha chrysomela** (*Newman's R.*)—A very handsome species. It grows about 3 feet high; the stems branching freely, and the heads of flowers very large

and conspicuous, the disc being raised, and deep brown or black, and the ray-florets bright yellow. Flowers in July and August. Native of North America.

R. subtomentosum (*Downy R.*)—This species grows about 2 or 3 feet high, with erect branching stems. The lower leaves are three-lobed, downy, and toothed; the upper ones sharply lance-shaped and toothed. A very free-blooming, handsome plant. Flowers in August, lasting a couple of months.

Santolina (*Lavender-Cotton*).—This genus is more remarkable for neatness of habit than for beauty of the flowers. They are half shrubby in character; and several species have pretty hoary leaves, which, along with their dwarf habit, has suggested their use for certain styles of bedding out; but as hoary-leaved subjects they are inferior to many others that we already possess. They are neat enough edging plants when they are properly dressed, but not decided enough in their grey tone. They are very pretty little plants for mixed-border decoration, and for rockwork pleasing always to look upon, and when clothed with their yellow button-like flower-heads they are quite attractive. The more shrubby species are easily propagated by cuttings in slight heat, in spring, after growth has well begun, choosing the cuttings moderately hard at the base. If a little bottom-heat cannot be given, they will strike quite well under a hand-light, in a warm situation in light, very sandy soil; but they do not root so freely in autumn, after growth is mature and hardened. The more herbaceous species—of which *alpina* is the only one amongst those selected—may be freely enough propagated by division in autumn and spring. They prefer a light sunny aspect and well-drained soil, but are not fastidious as to the quality otherwise.

S. alpina (*Alpine Lavender-Cotton*).—A dwarf or prostrate plant, closely carpeting the ground with deeply and regularly cut silky-grey leaves. The flower-stems are erect, each bearing one discoid yellow flower. They are never very profuse at one time, but continue from July till late autumn. Native of Monte Marrone in the Abruzzi. It is best adapted for rockwork, but may also be used in the front lines of mixed borders in light sandy soil.

S. Chamæ-Cyparissus (*Common Lavender-Cotton*).—This forms compact shrubby bushes of hoary branches and leaves; the latter are divided into four rows of blunt short teeth. The flower-stalks support each one flower similar in character to the last. Flowers in July and August. Of this species there are several varieties more or less distinct, which appear in lists as species, the most marked of which are *S. C. incana* and

S. C. squarrosa. They are very near in character and aspect to the normal form, and the first variety is the most distinctly hoary. They are all compact neat plants, growing to the height of about 2 feet, and are chiefly suitable for the mixed border, unless the rockwork is extensive, when they may very properly be used in prominent positions in the decoration of it. There are several other species of *Santolina* in cultivation, but those described are the most distinct and useful. *S. viridis* may be mentioned, however, as being a very peculiar species, having the habit and leaves of the Common Lavender-Cotton, but quite destitute of hairs or down, and dense dark-green both in young branches and leaves, which indeed would be the colour of all the shrubby species, but for the hoary down which distinguishes more or less most of the others. Native of southern Europe.

Solidago (*Golden Rod*).—This is a very extensive genus, but, like many of the larger genera of *Compositæ*, it abounds in bad species, which are not definable by any obvious or tangible characters. Regarded as ornamental plants, scarcely one of them may be admitted in select collections. They are in the mass rough bulky plants, abundantly floriferous; but the inflorescence is common and weed-like, and a few are diminutive uninteresting things, fit only for botanical collections. A few of the more distinct and free-flowering or showy species may be employed often with advantage amongst shrubs, and they are generally very fit subjects for naturalising; and in this way they have only one enemy—rabbits—to contend with; for the stronger species are fully equal to the grossest of our indigenous vegetation if planted out in strong tufts; but these creatures make short work of them, cropping down as they assiduously do every inch of tender growth as it starts in spring. They succeed in any soil or situation, not objecting to considerable shade, so that they may be naturalised in woods successfully. All are readily increased by division in autumn, winter, or spring.

S. altissima (*Tallest Golden Rod*).—This is a gigantic coarse plant, reaching the height of 6 or 7 feet, with stout erect stems, clothed with deeply-toothed lance-shaped leaves, rough to the touch and wrinkled. The panicles of flower are large, and the divisions or racemes of which they are composed are one-sided. Flowers in August and September. Native of North America.

S. reflexa (*Reflexed-leaved Golden Rod*).—About 3 or 4 feet high; the stems erect, clothed with hairs and with lance-shaped slightly-toothed leaves. Panicles of flowers densely clustered. Flowers in August and September. Native of North America.

S. rigida (*Rigid Golden Rod*).—This is one of the most ornamental, and may be very well admitted in large collections of mixed-border plants for variety's sake. It grows rigidly erect, with oblong, roughly-hairy leaves. The stem divides at the top into erect compact racemes, appearing in September and October.

Stokesia cyanea (*Blue-flowered S.*)—This is a very handsome plant, growing about 18 inches or 2 feet high. It forms dense tufts of stem-clasping leaves, spatulate in form, quite entire on the margin, but slightly hairy. The flower-heads are large, deep sky-blue, appearing in September. Native of Carolina and other Southern States of America. It flourishes quite well in any ordinary garden-soil if well drained, and may be propagated freely by division. This is a choice plant. I have no experience of it north of London; in that district it is perfectly hardy, but in cold wet localities it would in all probability not endure the winter without protection; and in such localities it would at any rate flower so late as to be almost useless. It has been recommended as a pot-plant for greenhouse decoration in early winter, and it is well worth a place indoors or out. In warm favourable localities it continues to bloom far into winter out of doors.

LOBELIACEÆ.

This is a large and brilliant order, the members of which are mostly inhabitants of the warmer regions of the world. Very few of them are hardy enough to endure the winter climate of the British Islands, but a good many of the perennial herbaceous species are indispensable in mixed flower-borders and in other styles of ornamental gardening, and consequently deserve some notice here in detail. The culture of each genus will be given in its proper place as it comes under notice.

Lobelia is an extensive family, composed of a few annual and biennial and a large number of perennial herbaceous, and a few evergreen suffruticose, species. It is liberally distributed over many of the warmer parts of the globe, but in Europe and northern Asia representatives are few and rare. Britain is favoured with two species, *L. urens* and *L. Dortmanni*; the former a very rare plant, having hitherto been found in one locality only—in Devon, near Axminster; and the other, being

aquatic, and found in only a few of the lakes in the three great divisions of the kingdom, may be regarded as a merely local plant in this country. The reputation of the genus for ornamental purposes is deservedly very high. There is indeed little contained in it that may be condemned as weedy or uninteresting; while of many species and varieties it may be correctly said they are unsurpassed for brilliancy of colouring and adaptability to every style of flower-gardening, whether rustic or refined, ribbon or panel, masses of one colour or mixtures of many colours, on any scale, small or great, from the humble patch in the cottager's mixed bed or border, to the thousands that adorn the gardens of the rich and luxurious. But until very recently little has been heard and less seen of *Lobelias* in this country, except in so far as the justly popular *L. erinus* and its several excellent varieties, or the pretty annual *L. gracilis* or *campanulata*, have brought them into view. It is refreshing, however, to observe that the tide of popular favour is now fairly setting in the direction of the old-fashioned and long-neglected tall herbaceous species, whose striking aspect and sparkling colours are unfamiliar to the majority of young gardeners, but will be pleasingly remembered, either as pot or border plants, by older men. Scarlet and crimson, blue and purple, in various shades, and white, were the sum of the colours of these tall *Lobelias*, till within a few years ago; but they have recently yielded to the art of the florist, and now we have varieties in carmine, cerise, claret, magenta, pink, ruby, with many shades of purple and scarlet and crimson, while these are varied still more in certain varieties with white. There is also in some sorts an increase in the size of the individual flowers, and there is greater variety in habit. Some varieties are dwarf and diffuse, others tall and strict; and in this respect there will soon, perhaps, be such diversity of character as will render *Lobelias* of this section adaptable to very general use in bedding out. As subjects for the mixed border, nothing can surpass these tall perennial *Lobelias*; and it is astonishing that the species and the older varieties should ever have been allowed to fall into disuse for that purpose, for under good cultivation they are striking, bold, and handsome. Their cultivation is a very simple matter. From the combined influences of cold and wet the soft succulent underground stems are liable to perish in winter if left out of doors where they grow, unprotected; protection of some sort is therefore necessary. Some leave them where they made their growth till spring, protecting them with a mound of coal-ashes or any other available protecting materials; others lift them as soon

as flowering is finished, and stow them away in coal-ashes or dry sand in sheds, under stages of cool plant-houses or in cold frames; and a friend of the writer, who was very successful in the cultivation of *Lobelias*, kept his roots in tubs of water under cover to prevent freezing; but the water, on account of its liability to become putrid, required frequent renewal, a circumstance, doubtless, that prevented my friend from making converts to this pickle-tub method. My own experience is in favour of lifting the roots in autumn immediately after flowering is finished, dividing them, and potting the offsets singly in the smallest pots they can be got into, afterwards plunging the pots to the rims in coal-ashes in a cold frame. Liberal airing in favourable weather, and protection during frost, are all that they will need of attention and labour till the early months of spring. To do them thoroughly well, they must have an early start; and for this purpose a hotbed, in which a temperature ranging from 60° to 65° can be kept up, should be in readiness to receive them by the second week in February. Examine and trim the plants, and transfer them to the hotbed, not plunging them, but merely setting them on a bed of ashes. They will soon begin to grow, and will require shifting and constant attention to watering, but as yet very carefully. Continue to shift as required by the progress they make up till the end of April, when they should get their final shift and be transferred to a cold frame, kept close till they are inured to it, and afterwards carefully hardened off for planting out in the end of May. They are not particular as to kind of soil, but are very much so as to the quality. Loam and peat and well-decayed stable-manure in nearly equal parts, and abundance of grit of some sort to keep it open and porous, is a compost in which these *Lobelias* delight in pots, and the beds or borders that they are designed to occupy out of doors cannot possibly be made too rich for them. They are very impatient of drought when making their growth, and will absorb almost any quantity of water; it should not therefore be spared.

L. amœna (*Blue American L.*)—This is a very rare species in cultivation. I am not aware that it is to be found in nurseries at all, and it certainly is in very few botanic gardens. It is one of the hardiest if not one of the showiest, and continues to bloom for a long period in summer and autumn. The plant grows about 2 feet high, with moderately erect, round, and smooth stems. The leaves are lance-shaped, sharply but slightly toothed. The flowers are a very pleasing shade of blue, in long terminal one-sided spikes, and begin to open

about the end of June, and continue often till frost cuts them off. Native of North America.

L. cardinalis (*Cardinal-flower*).—This is one of the best known and oldest, having been known to gardeners for a couple of centuries, and is one of those which florists have lately been operating upon with so much success in the production of new varieties. It is an erect-growing plant, reaching the height of 3 feet or more under good cultivation. The leaves are lance-shaped, tapering only slightly till near the point, and distantly and slightly toothed. Flowers in a terminal one-sided raceme, brilliant scarlet, appearing in July onwards till October. Native of Virginia. There is a scarce and pretty dwarf variety of this species named *L. c. nana*. It grows about 1 foot or 18 inches high, and is valuable chiefly on this account for narrow borders or small beds.

L. Dortmanni (*Dortmann's L.*)—This is a British aquatic species. It is only adapted to grow in ponds or lakes, or where it may be immersed; but where such places require to be furnished with choice vegetation this plant should be known and remembered: the blue spikes or racemes are very beautiful, waving above the surface of the water. The plant forms dense tufts of dark-green, short, nearly cylindrical, blunt, hollow leaves, which are quite immersed. The flower-stems are erect, and carry the spikes of beautiful pale-blue flowers about 6 or 9 inches above the surface of the water. Native of the lakes of northern Europe and America, besides those of Great Britain and Ireland. It is only suited for shallow water, and is a good subject for hardy aquariums.

L. fulgens (*Fulgent L.*)—This is a handsome and striking plant, and one of the species at present engaging the attention of florists. It grows about 3 feet high, or 4 if well encouraged. The leaves are narrow, lance-shaped, long, and slightly toothed, and dark red. The stems are smooth and round, and very slightly downy. The flowers, in rather loose terminal racemes, are intense glowing scarlet. They appear in July or August, and last till frost cuts them off. Native of Mexico. The variety *L. f. ignea* is, if possible, a more striking plant than the species—the leaves are darker in tone, the stems very slightly if at all downy, and the flowers more intensely glowing.

L. splendens (*Splendid L.*)—This species, if anything less brilliant in colour than the last, is yet the more imposing of the two. They are very nearly related, and resemble each other in a general way rather closely. But in the present plant there is more vigour of stem, broader and thicker leaves, and both stem and leaves are closely covered with very short, hoary

down, through which the dark colouring of the leaves slightly appears, and the raceme is denser and more compact and the petals broader. In many of the new varieties there is more of the character of this species than any of the others observable. The old variety named *L. sp. St Clair* is yet one of the most brilliant, and unsurpassed by any of the new scarlets. Native of Mexico.

L. syphilitica (*Syphilitic L.*)—This species grows about 2 feet high, with furrowed or angular stems and oblong leaves, narrowing sharply at both ends, and irregularly toothed. Flowers in rather leafy racemes, light blue, and appearing in July and the three succeeding months. There is an excellent hybrid of this species, very hardy and showy, but not over-plentiful in the country, at present known by the names *hybrida*, *Milleri*, *Purple Standard*, and *speciosa*. In dry soils it may be left out of doors with impunity for the winter; but, like all the others, it flowers better and earlier from having a little start in heat in spring. The flowers are larger than those of the species, and are bright bluish-purple, and the plant grows about 2½ or 3 feet high.

There are other species of *Lobelia* yet to introduce or re-introduce, not perhaps superior to some of those named above, but equal to them in beauty, and quite distinct, which, now that the genus is taken up by florists, might, by the infusion of new blood, bring about different types to any that we have at present.

Tupa.—Little generally is known of this magnificent family of Lobeliads in this country; *T. Fueillei* is the best known, and is to be met with about the Glasnevin and College Botanic Gardens, Dublin, and occasionally at Kew; and as seen in the border extending outside the houses at the first-named place, in the months of September and October, rising to the height of 4 or 5 feet, loaded with its brilliant flowers, it will be admitted to have few equals. But it is only in such places and in such a border that it can be grown to perfection in the climate of this country without assistance in spring under glass, and the shelter of the same during winter. It is a native of Chili, and will not endure, in most localities, the cold and damp of even our ordinary winters, but it may be lifted in autumn and treated in all respects as recommended for the tall herbaceous Lobelias. It will not, however, accommodate itself so well to any inferior position out of doors, but must have the most sheltered and warm position possible. It forms a fine pot-plant, and well repays any amount of care and trouble either in pots or planted out that will bring it to perfection. In

most parts of Scotland, it is to be feared, it would do little good except as a pot-plant ; but in the south it might be turned to account as a subject for the subtropical garden. The votaries of that system may make a note of it, that they have no more gorgeous subject on their list. It combines the requisites of bold and striking growth, proportionally ample foliage, and a profusion of splendid scarlet flowers. In favourable places, too, it might be used with advantage in ordinary bedding out for the centres of large masses, and for breaking the uniformity of long lines of borders.

T. Bridgesii, syn. **Lobelia Bridgesii** (*Bridge's L.*)—This species was formerly in gardens in this country, but was lost, and has very recently been reintroduced. It grows about 4 feet high, with stout stems, clothed with lance-shaped leaves, narrowing much and sharply to the point. The flowers are pink, in dense racemes, appearing in late summer. Native of Chili.

T. Feuillei, syn. **Lobelia Tupa** (*Feuille's T.*)—The stems are stout and slightly woody at the base. The leaves are broadly lance-shaped, sharply toothed, and clothed with greyish down. Flowers in rather dense erect spikes or racemes terminating each stem, are brilliant scarlet, and appear in September and October. Native of Chili.

CAMPANULACEÆ.

This is a very distinguished order amongst herbaceous plants. It presents the largest number of ornamental species for its extent of any yet considered. There is very little comprised in it that is not ornamental, more or less, and many of the species are amongst the most beautiful of herbaceous plants; indeed, without a large selection of the *Campanulaceæ*, the best collection would be incomplete and unsatisfactory. It is almost exclusively an herbaceous order, as there is nothing strictly woody contained in it ; but there are a few suffruticose plants unfit, however, to associate with herbaceous ones in any ornamental arrangement, even if they were hardy, but I am not aware of any of them being capable of withstanding the rigour of our winter climate. The principal genus of the order is *Campanula* ; it is the largest and most beautiful, while it is also the type of the family. The five or six other genera from which

we can select are all beautiful, but nearly all are very limited in species. In a general way, *Campanulaceæ* delight in rich sandy loam ; but many are most accommodating in respect of soil and of situation also, while others are adapted only to specific conditions in both these respects. It will be more useful, therefore, to defer cultural requirements to be considered along with the different subjects selected.

Adenophora is a genus closely resembling, in all superficial features, *Campanula*, from which it was separated on account of the glandular cylindrical tube or disc that surrounds the base of the style. The generic synonym *Campanula* is therefore common to all the species, and under that name they are sometimes circulated in Continental lists. They are very useful hardy herbaceous plants, but possessing little variety of colour, stature, and habit—blue, in lighter and darker tints, being the colour of all. They will be found most useful for the shrubbery and mixed border, and are easily cultivated in almost any kind of garden-soil. Propagate by division and by seeds.

A. liliifolia (*Lily-leaved A.*) is perhaps the best and most useful species in the family. It grows to the height of about 2 or 2½ feet, with narrow lanceolate leaves and rather erect stems, terminating in panicles of pale-blue flowers, which appear in the end of May, and last till the middle or end of September. Native of Siberia and Dahuria.

A. tricuspidata, syn. **Campanula denticulata** (*Three-pointed A.*)—This is a very elegant species, growing to the height of 18 inches or 2 feet. The root-leaves are roundly egg-shaped, rather coarsely toothed. Flowers in paniced racemes, bright blue and profuse, appearing in the end of summer and in autumn. Native of Dahuria.

Campanula (*Bell-Flower*).—This is a very numerous and natural group of plants. A strong family likeness pervades the whole, yet there is much diversity of habit and stature, which renders them useful for many purposes, and fit for a variety of positions. From the bright and beautiful character of the few species with which we are familiar in cultivation or in nature in this country, we may fairly estimate the ornamental value of a large number of the perennial species. Our own “Scottish Blue-Bells,” which with grace and brightness light up for a long period in summer the hedge-banks and waste places all over the country, may be taken as a fair type of the family in both the scientific and practical sense. A few species from Madeira, the Cape of Good Hope, and Australia, are suitable only for frame or greenhouse culture ; but the great home of

the family being northern and southern Europe and western Asia, a very large majority are hardy enough to endure the severest winters of our climate. They are all of easy culture. Many may be propagated by cuttings, but the largest number are best increased by division or by seed.

C. aggregata (*Crowded-flowered C.*)—This is one of the best of a small section of Bell-Flowers, distinguished by having their flowers drawn together in clustered heads in greater or less density. The present plant grows about 2 feet high; the stems are angular and leafy, the leaves lance-shaped and regularly toothed. The flowers are pale blue, stalkless, in clustered heads, appearing in July and lasting for a month or two. Native of Bavaria. It delights in a sunny position, and in light rich loam.

C. alpina (*Alpine C.*)—A dwarf but erect plant, about 6 or 9 inches high. The leaves are lance-shaped, downy. The flowers are dark blue, on longish stalks, grouped thinly on the short leafy stem in loose pyramidal racemes. Native of the Alps of Switzerland and high elevations. An excellent rock-work species and good border-plant, requiring a dry rich soil and open situation.

C. carpatica (*Carpathian C.*)—This is a very handsome tufted plant, about 9 inches high. The leaves are heart-shaped, toothed on the margins. The flowers, on long slender stalks, are very large, broadly bell-shaped, bright blue. It is one of the showiest and best of the genus, and succeeds in any position in border or rockwork, and in any ordinary garden-soil. It has been used in bedding-out with good effect, and to those having very limited glass accommodation it is worthy of attention for this purpose; for being hardy, it requires no other help in spring than that of lifting, dividing, and replanting; but this point is of considerable importance, as it conduces to more continuous and profuse blooming. The seed-pods, also, will require to be assiduously picked off as they form, for the same reason. There is a very beautiful pure-white variety, and a bicolor or blue-and-white variety also, an excellent and showy plant, but barely so free-blooming as the species; and there is a rare dark-blue sort named *Borwoodiana*. Native of the Carpathian Mountains. Flowers from June till September.

C. cenisia (*Mont Cenis C.*)—This is a very diminutive plant, only 3 or 4 inches high, forming pretty little carpets of bright lilac-blue flowers, only one to each slender stalk. A very pretty and interesting plant, suitable mostly for rockwork in this country, but in sandy yet moderately rich soil it will succeed; also in the front of mixed borders. Flowers in July

and August. Native of very high stations on Mont Cenis and the Alps generally.

C. *Elatines* (*Elatine C.*)—This is a prostrate tufted plant, and in most parts it is clothed with downy hairs. The flowers, in loose racemes, are deeply cut into five lobes, and pale blue, appearing in June and July. Native of Piedmont, and best adapted for culture on rockwork in gritty loam.

C. *fragilis*, syn. **C. *diffusa*** (*Brittle C.*)—A tufted, diffuse, dwarf plant, forming dense patches of bright-green, roundish-toothed leaves, while those of the stems are broadly lance-shaped. The flowers are borne in loose, somewhat leafy racemes, are broadly bell-shaped and deeply divided, pale soft blue. A very hairy variety in nearly all its parts, named *C. f. hirsuta*, is peculiar in aspect, but not in any other respect different or superior to the species. Both are tender in heavy wet soils, but not so in those that are light, or sandy and dry; they are beautiful ornaments of rockwork. Native of Naples and Sicily.

C. *garganica* (*Gargano C.*)—Nearly related to the two last, and, like them, dwarf, diffuse, and tufted. The root-leaves are roundish, and deeply heart-shaped at the base; those above egg-shaped, and all toothed. Flowers in loose racemes; azure blue, with a white eye; opening in May and June. The same treatment as the last two. Much may be done by introducing a few porous stones about the roots of these more susceptible alpine plants in open flat borders, to reconcile them to such positions; and where the soil is naturally wet, some elevation of the surface would at the same time be beneficial. Native of Istria and Monte Gargano.

C. *glomerata* (*Cluster-flowered C.*)—Grows about 2 feet high, with many flexuose, almost straggling stems, bearing terminal and axillary heads or dense clusters of flowers. The flowers are small individually, but collectively they form a large and effective inflorescence. The most common colour is deep purple or violet, and of this there is a double variety. But there is also a pure-white sort, single and double, that is very ornamental and desirable. The flowers last from June till September. Native of the south-eastern counties of Scotland and the greater part of England, and extends over most of Europe and Russian Asia. Fond of rather a dry sunny position and rich soil. The two forms generally regarded as species, named *C. speciosa* and *C. cervicarioides*, are very closely related to this, if not merely varieties. The first is mainly distinguished from *glomerata* by its larger individual flowers; and the second, by its taller and more straggling growth.

C. isophylla, syn. **C. floribunda**, has much of the appearance of the Brittle C., but has broader leaves; is even more dense and tufted, and a more profuse bloomer. The flowers, which appear in June and July, are pale blue, with a greyish-white centre. Native of Liguria; perfectly hardy, but impatient of wet.

C. latifolia (*Broad-leaved C.*) is a fine stately sort, of erect habit, with simple stems, which in rich soil reach the height of 5 feet, and are terminated by a long leafy raceme of purple flowers, appearing in July and August. This species is invaluable for planting in woods. It reaches its greatest magnitude and beauty in rich loam, but makes a fine display in poor, shallow, and even dry soil, if partially shaded by trees overhead. There is a dull-white flowered variety, which forms a good contrast to the purple one. Native of woods in the north of England and south of Scotland, and is widely spread over northern Europe and western Asia.

C. macrantha (*Large-flowered C.*)—This species is nearly allied to the Broad-leaved C., but is a dwarfer plant, and is further distinguished by having longer and deeper-blue flowers, and by the slightly-branching stems. It is an erect handsome plant, flowering in July and August. Cool moist loam suits it best. Native of Dahuria. Height about 2 feet.

C. nobilis (*Noble C.*)—The nobility of the plant is in its flowers. It grows about 18 inches high, with slightly-branching stems, quite erect. The lower leaves are egg-shaped, on short stalks, and coarsely toothed; the upper ones lance-shaped and stalkless, and all somewhat hairy. The flowers are long and widely funnel-shaped, white or creamy-white, and spotted with crimson or dark purple, drooping on the stem, and borne in erect racemes. Native of China. I have had no experience of this plant in the north, and would be doubtful of its being hardy in cold wet localities. In the London district it is perfectly hardy in the open ground. It prefers light rich loam. There is a variety the flowers of which are not spotted.

C. persicifolia (*Peach-leaved C.*)—One of the handsomest, and at the same time one of the most common, species. It reaches the height of 2 or 3 feet, the large broadly-campanulate blue flowers being arranged in a close raceme along the greater part of the stems. It begins flowering in June, and lasts on till September. There are five or six varieties, all very beautiful. That named *C. p. coronata* is perhaps the most beautiful of them all, the flowers being pure white and double; and the double blue, in the same style, is a beautiful companion to it. There are other double whites and double blues, but inferior in

character to these named. The species is a native of central and southern Europe.

C. pulla (*Violet C.*)—The blue form of *C. pumila*, which this resembles in habit and is related to, is often confounded with it, but it is quite distinct from any of its near relatives. It is a dwarf tufted plant, rarely exceeding 6 inches high, having egg-shaped, slightly-toothed leaves. The flower-stems are erect, unbranched, and terminate in a solitary dark-blue flower, opening in June and July. Native of mountain pastures in south-eastern Germany. It is very generally grown in pots, and is adapted only for that method of culture or rockwork. It appears to be particularly averse to the dryness consequent on the evaporation that takes place from the surface of beds and borders that are well kept, and this seems to be the principal reason why it succeeds so ill when it is planted on flat dressed surfaces; and mountain-pasture plants generally suffer more or less from the same cause. A few stones placed about the plant on the surface of the ground obviates this evil much, preventing as they do to a considerable extent excessive evaporation, and the fluctuations of temperature consequent thereon. The plant is, however, a very rare one, and, except where it is plentiful, it should not be risked out in borders, but be kept in pots or on rockwork, where other similarly fastidious subjects may have a corner devoted to themselves.

C. pumila (*Dwarf C.*)—Not the very smallest of *Campanulas*, yet amongst the smallest. It is one of the commonest, especially as regards the white variety, being often seen in cottage and other gardens where herbaceous plants are allowed to hold a place. It forms flat carpet-like masses of bright-green, small, broadly egg-shaped, or roundish-toothed leaves. The flowers are very numerous, in short racemes; the flower-stalks long and slender, and one flower to each stalk. Although one of the tiniest of flowering plants, it succeeds in almost any kind of soil, rich or poor, wet or dry, and in any situation, and if treated as recommended for the Carpathian *C.*, it flowers as continuously and as long as that species.

C. pusilla (*Diminutive C.*)—This is even a smaller plant in all its parts than the last, in height rarely exceeding 4 inches. The leaves are roundish, heart-shaped, smooth, shining green, and toothed. The flowers are pale blue, in few-flowered racemes, and appear in June and July. Suitable only for rockwork decoration. Native of Switzerland. Moist, very gritty loam is the most congenial soil to it.

C. rapunculoides (*Creeping C.*) grows to the height of about $3\frac{1}{2}$ feet in cultivation, with simple erect stems, terminating in

graceful leafy racemes of dark-blue flowers in June and July. One of the most showy of the family, the inflorescence being of great length—often $1\frac{1}{2}$ foot. It is very suitable for planting in woods and other semi-wild places. It is striking also in the mixed border, but rather troublesome and encroaching by means of its creeping underground stems. Native of woods in Britain, Europe generally, and western Asia.

C. rhomboidea (*Germander-leaved C.*)—A very pretty species, growing about 18 inches high. The leaves are rhomboid, and roughly' and rather unequally toothed. The flowers are in open, spike-like racemes, short and openly bell-shaped, pale blue, appearing in July and August. Native of Switzerland.

C. rotundifolia (*Scottish Blue-Bells*).—Though not very "far fetched," this plant so wonderfully increases in beauty under care and culture that I cannot pass it over in this list without strongly recommending it to those who may not have given it a trial. It is one of the most graceful, profuse, and lasting in bloom of all *Campanulas*, and adapts itself readily to any position. A white and also a pink variety, to be met with occasionally, are interesting and pretty.

C. sarmatica (*Betony-leaved C.*)—This is a very distinct species, and beautiful. It grows about 2 feet high. The leaves are lance-shaped, downy, and irregularly toothed. The flowers are pale blue, in handsome racemes, opening from June to August. An excellent border-plant. Native of Siberia.

C. Trachelium (*Throatwort C.*) is a tall handsome species, with erect stems 3 or 4 feet high, and large violet flowers, arranged in terminal leafy racemes, which appear in July and August. In the early stages of growth it resembles the common Nettle, having large coarsely-toothed leaves of the same form. Its geographical distribution is nearly the same as that of *C. latifolia*, and it is found inhabiting similar places, and may be used for the same purposes. There are three varieties, showy and desirable—the double blue, double white, and single white.

C. turbinata (*Russet C.*)—A very beautiful, dwarf, rigidly-tufted plant, producing large openly-bell-shaped flowers, dark purple, and resembling in shape those of the better-known *Carpathian C.* The flower-stems are erect, branching, and about 9 inches high. This is one of the handsomest of the family, and suitable alike for border or rockwork. Native of the mountains of Transylvania, and succeeds in rich light loam.

C. Zoysii (*Zoys's C.*)—Nearly related to the Mont Cenis C., but more robust and erect, though tufted. The tufts of root-leaves are egg-shaped, those of the stem narrower. The flowers are deep blue, a few together on each stem, and the divisions

of the corolla are bearded. Flowers appear in June, July, and August. Native of Carinthia and Styria, in high mountain positions. Flourishes in rich light loam, and is adapted for either border or rockwork. Height about 6 inches.

Jasione (*Sheep's Scabious*).—A small genus, very distinct in structure and aspect from all other genera of the order. It is not a striking or showy family, and is introduced here chiefly on account of the close approach it makes in the structure of its flowers to the Composites, which will furnish it with a special interest to those who would trace the affinities of plants. The anthers are, as in Composites, united at the base, and form a ring or sheath around the style. The heads of flower are in the way of some of the *Scabiosæ*, and are pretty, though not conspicuously beautiful.

J. humilis (*Lowly Sheep's Scabious*) is of creeping, somewhat tufted, habit, rarely exceeding 8 inches high, bearing on short stalks compact heads of blue flowers about July and August. The plant is quite hardy, but found at high elevations on the Pyrenees, and enjoying there a blanket of snow during winter; it often succumbs to the combined influence of damp and frost unprotected in our climate. A little fern, dry litter, or other similar material, is all that is necessary to keep it safe. It should be cultivated on rockwork, in light rich loam on the driest possible bottom, but liberally supplied in summer with water during drought.

J. perennis (*Perennial Sheep's Scabious*) is a taller species, reaching the height of 10 or 12 inches, with stems bent at the base, but afterwards erect, bearing on long stalks compact heads of bright-blue flowers, surrounded at the base with a broad rosette of bracts. The flowers appear in June, July, and August. This is a good useful rock-plant, requiring the same treatment as the preceding. In well-drained light loam it flourishes, also in the open border. It is from the mountains of central and southern Europe.

Phyteuma (*Rampion*).—One of the prettiest, though not the most showy, of *Campanulaceæ*. It is nearly allied to *Campanula*; but the species are easily distinguished at a glance from any of those of that group, bearing the flowers in heads; and from *Jasione* by the curved cylindrical form of the corolla in the bud. They are not destitute of beauty of colour, but they cannot be said to be striking in that respect; they are, however, undoubtedly pretty and highly interesting. They are adapted for culture on the rockwork or in the mixed border, and flourish in rich light loam, and are propagated by division in spring.

P. campanuloides (*Campanula-like Rampion*).—This plant grows about 18 inches high, with erect single stems, terminating in a raceme of blue flowers. The leaves are egg-shaped, sharp-pointed, and toothed. Flowers in June and the two following months. Native of the Caucasus.

P. hemisphæricum (*Globular-headed Rampion*).—A very dwarf species from Switzerland, rarely exceeding 6 inches high, is somewhat tufted in growth, the stems terminating in dense hemispherical heads of bright-blue flowers, which appear in June and July: best adapted for cultivation on rockwork in light rich loam in a moderately dry position. This is a pretty and interesting plant.

P. orbiculare (*Round-headed Rampion*) enjoys a place in the British flora, but is rather rare at home; it is found, however, plentifully enough in the mountain pastures of central and southern Europe. It varies considerably in height in nature, but in cultivation it averages 1 foot high. The stems are somewhat decumbent at the base, but erect in the upper portion, and terminating in globular heads of violet-coloured flowers, which appear in July and August. It is most suitable for rockwork, but succeeds well in the front lines of mixed borders.

P. Michellii (*Michel's Rampion*) has oval flower-heads, which elongate as the flowers open into cylindrical spikes of bright-blue flowers in July and August. It grows from 6 to 10 inches high, is adapted for culture on either the rockwork or in the mixed border, and is a pretty and distinct species found in various parts of the south of Europe on mountain pastures. *P. scorzonærifolium* and *P. angustissimum* differ little in cultivation from *P. Michellii* as regards colour of flower and the form of the flower-heads; the former, however, has more elongated heads, and the leaves, on longer stalks, are rather broader.

P. Scheuchzeri (*Scheuchzer's Rampion*) grows about 6 or 9 inches high, with broadly-lance-shaped leaves and globular heads of flower, opening in May, June, and July. A variety with shorter and rather broader leaves and shorter bracts, named *P. S. Charmelii*, and often distinguished as a species, is not sufficiently distinct floriculturally to be desirable in any but botanical collections. Both forms are excellent rockwork plants, and are also adapted for the front lines of mixed borders.

P. spicatum (*Spiked Rampion*).—The plant grows about 18 inches or 2 feet high. The stems are erect, thinly clothed with toothed sharply-lance-shaped leaves. The flower-heads are shortly and broadly spike-like. The flowers are dull white. A tolerable plant for the mixed border; but it will probably be found more useful for naturalising in open woods, where the

natural vegetation is not of a rank kind. Flowers in June and two succeeding months. Native of central and southern Europe.

Platycodon grandiflorum, syn. **Campanula grandiflora**.—This handsome plant grows in straggling, weak fashion, about 1 foot high. The leaves are narrow, egg-shaped, slightly glaucous, and minutely toothed. The flowers, deep blue, are very large, open, bell-shaped, in the way of *Campanula carpatica*, in spare terminal racemes. They appear in July and August. Native of Dahuria. There are two handsome white varieties, the one single, the other semi-double, but both rare, though very desirable plants.

P. chinense, syn. **P. homalanthinum**.—This does not differ materially from the last. The plant has broader leaves of the same form, and is in every way more luxuriant. The flowers are of the same form, and about the same colour, and appear about the same time. Both are excellent showy border-plants, and in the north are looked upon as doubtfully hardy: they resist any degree of cold, however, that they are likely to be subjected to in any part of the kingdom, but cannot endure the combined influences of cold and wet. If, therefore, the soil is wet and heavy, it is advisable to lift a few roots before winter sets in, and store them in any cold dry place, such as a cold frame or peach-house border; or by putting a hand-glass over the patches, they need not be lifted from their permanent positions. Where the soil is light and well drained, there is no necessity for lifting the roots; but a small mound of coal-ashes placed over them will be beneficial in protecting the crowns from the possibility of harm. They delight most in a sunny warm spot, and a little peat in the soil is very beneficial. The roots are fleshy, and the plants are increased by division of these.

Symphiandra is a genus of *Campanulaceæ*, consisting, so far as is at present known, of only one species. It is simply a peculiar *Campanula*, and was separated from that genus on the ground of the anthers adhering together somewhat in the manner of the Composites. The only species, *S. pendula*, syn. *Campanula pendula*, is a native of the Caucasus. It is a choice and distinct plant, growing 1 or 1½ foot high, with erect stems terminating in rather spare spikes of drooping cream-coloured flowers, large and campanulate, and appearing in June and July. It is regarded as being difficult to keep, and by some on this account it has been set down as a biennial, but it is not so. It is, however, very impatient of full exposure to the sun in light dry soils, and delights in a cool, somewhat shady situation, as on the north side of rockwork or a bed of shrubs.

where it would escape the scorching effects of the mid-day sun; and in such circumstances it will be found neither troublesome nor fugitive. Propagate by division in spring.

ERICACEÆ.

In the natural order *Ericaceæ* there are very few hardy herbaceous plants. Among the *Chimaphilas*, *Pyrolas*, and *Monotropas*, there are some curious and pretty things; but in a horticultural sense they are almost destitute of beauty, and at the most can only be recommended here for cultivation among alpins in partially-shaded rockwork, in sandy peat and a little loam. They should never be disturbed while doing well. But there are certain of the shrubby genera of this order of plants which contain species and varieties of great excellence for the herbaceous border, the margins of shrubberies, for grouping in the spring garden, and for decorating rockwork, as taste and circumstances may prescribe. *Erica* yields the largest number of valuable things for these purposes. *E. carnea* and its varieties form, perhaps, the most interesting and beautiful group of these hardy heaths. They begin to bloom often so early as January, and continue flowering on till May and June. They are most easily cultivated, and, being of dwarf compact habit, they are available for the spring garden; and if kept in pots in the reserve ground, their value as temporary tenants of the beds of the summer flower-garden, in circumstances requiring these to be filled in winter, is very high indeed. *E. tetralix*, and the few varieties sprung from it, are handsome, and flower from June till August and September. *E. australis* is another early-blooming species. It comes on in March, and lasts till the end of May, and often into June. *E. mediterranea* begins to flower about the same time as the last-named species, but continues for a shorter period. This is by some considered merely a more erect and taller form of *E. carnea*, but as it is a remarkably distinct form, it is quite entitled to a specific appellation in gardens at least. The var. *nana alba* of this species is a fine compact sort for rockwork or for the spring garden. *E. cinerea*, one of the most common of our Scotch Heaths, is at the same time, in some of its varieties, one of the most handsome. They flower throughout the summer and autumn. *E. vagans* and its varieties, also summer-flowering, are pretty, dwarf, dressy things. *E. ciliaris* is one of the handsomest of hardy Heaths,

with large purple or pink flowers in leafy racemes. It flowers in summer and autumn. Some of the varieties of the common "*Ling*," *Erica* or *Calluna vulgaris*, are pretty, and well worth a little attention. They are now rather numerous, and vary much in habit, some forming neat tufts or cushions, while others are rather loose and straggling.

Menziesia furnishes several brilliant and elegant species and varieties. *M. polifolia* and its varieties, of which there are now eight or nine, are a beautiful and showy group of summer-flowering dwarf shrubs. The dark purple, the white, named *globosa*, and the *nana* varieties, are the best. The latter flowers from June far into the autumn, and is quite a gem. The charming and rare little *M. cærulea* is more difficult to grow and keep than the foregoing sorts, but it is well worth a little trouble. It succeeds best in sandy peat on rockwork, in a rather moist situation. *M. empetrifolia* is a most beautiful dwarf species from North America, with rosy-purple or pale-red flowers, which must be cultivated in the same way as the last-named species.

Azalea procumbens, syn. **Loiseleuria procumbens**, is rather rare, but a beautiful and attractive little evergreen shrub, with terminal clusters of pink or rose-coloured flowers. It should have a moderately shady place on rockwork in sandy gritty peat.

Bryanthus erectus, syn. **Menziesia erecta**, with something mongrel-like in its aspect, is a most beautiful thing, with heads or clusters of pink flowers in the way of *Kalmia glauca*, from which, as one parent, it is supposed to be derived, being regarded as a natural hybrid. It delights in a shady moist position on rockwork.

Epigæa repens is a dwarf, trailing, evergreen shrub, rarely rising above 9 inches high, with white, in some individuals pink, flowers in small clusters, very fragrant, delighting in shady places, and excellent for introducing into woods where the native vegetation is not of a rank character, and where the soil is peaty, or composed of decayed leaves and sand.

APOCYNACEÆ.

This is a magnificent order of plants, of which, however, there are very few herbaceous species, and only a few plants of any kind capable of being associated with herbaceous plants;

but such few as we have are very valuable, both on the score of their beauty and their adaptability to the decoration of positions that it is always difficult to get plants to live in, far less to do well.

Amsonia.—This is a genus of hardy herbaceous plants from North America. Without having any very strong claim to be considered beautiful, they have a certain distinction and elegance in their appearance that renders them valuable for certain ornamental purposes. They may be introduced among shrubs with very good effect, and they may be planted in open woods where their robust hardy nature will enable them to establish themselves when less vigorous plants would succumb before the encroachments of the native vegetation. Any ordinary good soil suits them well, and they are easily propagated by division or seeds in spring.

A. angustifolia (*Narrow-leaved A.*) grows about 2 or 3 feet high, with hairy stems and lanceolate leaves clothing them throughout. The flowers are produced in small panicles in the axils of the upper leaves, are light blue, and appear in July and August.

A. latifolia (*Broad-leaved A.*) is about the same in stature as the last, but the stems are usually destitute of hairs, and the leaves more broadly lanceolate. Flowers blue, in the same manner; the panicles, rather fewer-flowered, appear about the same time.

A. salicifolia (*Willow-leaved A.*) has hairless stems, and very narrow lanceolate leaves, attenuated at each end. The flowers are numerous, in small panicles in the axils of the upper leaves. They are blue, and appear about the same time as the others.

Vinca (*Periwinkle*).—This is the only British representative of one of the most beautiful natural orders in the vegetable kingdom. Like most of the other genera of the family, *Vinca* is more ligneous than herbaceous; indeed, only one species of the group may be properly classed with herbaceous plants, according to technical rule, but their dwarf habit and natural adaptability to similar purposes bring them nearer to that class of plants than to shrubs of any kind. They are most accommodating in their nature, growing freely in nearly all kinds of soils and situations, preferring moist, shady places, but not refusing to grow freely in those more dry and exposed. They grow freely in the shade and drip of large trees, and may be used for clothing naked banks with great facility and success. Several fine variegated forms also of the hardy sub-shrubby species may be used with good effect for those and for more select purposes, such as the edging of beds and borders of shrubs, draping rockwork and rustic work, and even for the edging of beds and borders of flowers. All are easily pro-

pagated by cuttings, in the autumn or in spring, in a cold frame or under a hand-glass, kept moderately close and shaded till the process of rooting has commenced, and by division either in autumn or spring.

V. major (*Large Periwinkle*) is the strongest and largest of the hardy *Vincas*; it grows from 1 foot to 2 or 3 feet high, according to soil and situation. The leaves are broad, ovate, bright shining green. There are two sorts of branches, those growing erect from the roots and bearing flowers, and those trailing and flowerless, and rooting as they extend. The flowers are large, somewhat bell-shaped, and blue in darker or brighter shades. It flowers throughout the spring and early summer. It is a native of England, in many parts, and of the south of Europe and the Caucasus. There are several interesting and valuable varieties of this species. A white-flowered sort, not very common, has a fine effect, mixed with the blue, on banks, or wherever masses may be grown. The *V. major*, var. *elegantissima*, has the leaves blotched and margined with creamy white, and is an elegant plant for many purposes. *V. major*, var. *aurea*, is even more beautiful and effective than the preceding. The leaves are richly marked with golden yellow, which in the spring, when young growth is being made, is very beautiful indeed. *V. major*, var. *reticulata*, is an elegant but not very striking sort, having the veins of the leaves delicately marked with golden yellow. In rich soils and moist shady situations this is not a constant variety, being apt to run green where over-well fed; but in poorer soil, and more exposed places, the effect of the rich colouring of the veins on the dark shining leaf-ground is very elegant.

V. minor, the common Periwinkle, is much more prostrate and slender than the foregoing species, and is, if possible, more useful for covering banks and for planting under trees. The leaves are smaller than those of *V. major*, and they are ovate-lanceolate. The flowers also are smaller, but more profuse; they are also more variously coloured, there being blue, purple, violet, pink, and white-coloured varieties. There are also two varieties with prettily-variegated leaves, the one creamy and the other golden yellow. It flowers in April and May, and onwards throughout the early summer months. Native of the same countries as the last, but enjoys rather a wider distribution in northern and central Europe.

V. herbacea (*Herbaceous Periwinkle*).—This is a very different and distinct plant from either of the preceding. The branches are herbaceous, and have a very limited extension: they are prostrate, and rarely exceed 9 inches in length. The leaves are

narrow, oblong-lanceolate; the flowers are blue or purplish blue, and appear in June, July, and August. This handsome and distinct plant is best adapted to the rockwork or mixed border, and prefers a light rich dryish loam in moderate shade. Division and seeds are the most practicable means of propagation. Native of Hungary.

ASCLEPIADACEÆ.

The same remarks apply to this order as to the last; it is a noble family, but herbaceous plants are rare in it, and very few of the meagre number are ornamental. The typical genus *Asclepias* is the only group that offers anything at all eligible for selection, and very few of it will suffice in even the most extensive collections.

Asclepias (*Swallow-wort*).—This is a considerable group, and nearly all the species are from North America. They are for the most part tall bulky plants, not, however, so coarse as many of the larger-growing herbaceous plants, but they require a good deal of space to develop themselves perfectly, and are therefore only suitable for growing in wide borders and in the back lines, or for naturalising in open woods and partially-shady places—and for this latter purpose they are very well adapted. They flourish best in light, rich, loamy soil, rather sandy than otherwise; but if the soil is well drained they are not so fastidious as to the texture or quality. Peat or leaf-mould is very congenial to them. Propagate by division in spring.

A. incarnata (*Flesh-coloured Swallow-wort*).—The plant grows about 3 feet high, with erect stems branching slightly towards the top. The leaves are opposite, lance-shaped. The flowers, small individually, are produced in dense umbels in the axils of the leaves on the upper ends of the stems and branches. They are pale red, and appear in July and August. Native of North America.

A. syriaca (*Virginian Swallow-wort*).—This species grows about 3 or 4 feet high, the stems being usually unbranched. The leaves are oval, and clothed with short down on the under side, but smooth above. The flowers are in umbels in the axils of the leaves in the upper part of the stem, and are purplish red and pleasingly odorous, appearing in July and August. Native of North America.

A. tuberosa (*Tuberous-rooted Swallow-wort*).—This species grows 2 or 3 feet high, the stems erect and branching. The leaves are lance-shaped, hairy on both sides. The flowers, in compact umbels, are orange, and appear from July to September. Native of North America.

GENTIANACEÆ.

A very handsome order of plants, and mainly herbaceous, though not all hardy. *Gentiana* is the principal genus, and the type of the order. In it there are some of the most beautiful and brilliant of hardy subjects, over which the true lover of plants becomes enthusiastic, and regards as his horticultural gods. The same may be said of *Spigelia*, of which only one species is occasionally observed in cultivation: a lovely plant, but always difficult to keep, and requiring too peculiar conditions perhaps ever to become popular, for without peculiar treatment it refuses to yield its charms, or live for any length of time. *Menyanthes* and *Limnanthemum*, or *Villarsia*, are the only two other genera in the order that, besides *Gentian* and *Worm-grass*, yield hardy ornamental subjects. These are both aquatic plants, and each furnishes only one species known at present to cultivation out of doors. They are handsome plants, adapted to ornament the margins of ponds or lakes, or other still shallow waters; and both are found in greater or less frequency in the natural lakes or ponds of Britain and Ireland, though not so often in those that are artificial as might be expected, considering their great beauty, elegance, and fragrance.

Gentiana (*Gentian*).—An extensive genus, comprising some of the loveliest of hardy herbs. The species are mostly inhabitants of alpine homes; some of them, indeed, flourish well only at the utmost limits of vegetation on the great alpine ranges of the world and the arctic regions, and such are difficult to cultivate for any length of time, however closely the circumstances of their wild homes may be imitated; but they are not a numerous class, though they certainly are in a few cases amongst the most brilliant of the genus.

Another group, more numerous and less difficult to manage in cultivation, are found in nature to prefer high mountain pastures, dry or moist, in gravelly soil in which vegetation is scanty, and in deep rich alluvial earth or peat where plants become comparatively luxuriant and more numerous. These

are the most useful species, because the least fickle and coy under the restraints of cultivation ; and amongst them the brilliancy of the finest of the high alpine gems is closely approached. All that may be cultivated in beds or borders flourish well in light, rich, sandy loam : well drained it should always be, but during the growing season at least it should be also moist. The high alpine species requiring rockwork or pots flourish in the same soil if the addition of a little peat and a good deal of gritty matter is made to it ; but the more special requirements of these will be alluded to hereafter more particularly. They are propagated by division and by seed. The former is a simple method with such species as *verna* and *acaulis*, which form turf-like masses not easily destroyed when cut up into even very small bits ; but with such as *lutea* more care is necessary. It and some of its allies form deep-descending roots and thick root-stocks or crowns, composed of only a few centres of vitality in even long-established plants, and they should not therefore be reduced minutely. Division should be done in early spring as soon as growth commences actively. Propagation by seed is a very tedious business, requiring some facilities in the shape of cold frames or hand-lights, and involving some considerable exercise of care and patience ; but when large increase of those sorts that are difficult to divide is determined upon, seed must be resorted to as the only means whereby it can be obtained. The seed of most of the *Gentianaceæ*, and of *Gentian* in particular, is slow to vegetate, especially if it may have lain some time in papers or in store ; but if it can be sown immediately it is ripe, some saving of time will be gained. The possibility of doing this will depend on whether the seed has been saved at home or purchased from the seedsman ; if the latter, then it will be at least a year before the majority of the seeds germinate. But many of the cultivated species seed freely, and advantage should be taken of this circumstance by sowing them as soon as they are ripe, when the greatest bulk of them will vegetate the following spring or early summer. The compost already spoken of is the best to sow in, using perhaps a more liberal allowance of sand, and the whole may be passed through a coarse sieve. Small-sized pots are the best—say 4 or 5 inches—because the most handy to move ; and what is of more importance, the smaller mass of soil is less liable to become sodden than that which is larger. The pots being well drained must be filled with the compost, pressing it firm and level in the process. Sow the seed thin and cover lightly ; fix the labels and water gently, and plunge the pots to the rim in coal-ashes in a cold frame. The only atten-

tion they will require for the remainder of the season, supposing the sowing to be done in summer or autumn, will be that of shading so long as the day is long and the sun strong, admitting air sufficient to keep the frame cool, and watering as it appears necessary, and that will be necessary always when the surface of the pots appears somewhat dry. On winter setting in, the frame will require to be protected during severe weather; but on all favourable days air may be admitted freely. On the approach of spring the pots should be examined, any mossy growth that may have made its appearance removed, and a slight sprinkling of fresh soil given along with a gentle watering to finish, when they may be returned to their quarters again. The admission of air so as to keep up a nice temperature in the frame and yet prevent excessive heating, a slight shading as the day lengthens and the sun's rays increase in power, and careful watering as required, are the only points essential to be observed till the plants begin to appear; but the shading should not be used except on bright days, and then only for an hour or two during the hottest part. When the plants appear in reasonable quantity it will be necessary to gradually inure them to more light and air; and while they are yet small and tender they must be carefully handled as regards watering: one rude dash of chilly water may cost the lives of hundreds of tiny plants. When they are fit to handle they must be pricked off into pots or boxes, or, what is better if at hand, they may be turned into a nursing-bed or shallow frame in suitable compost, pricking them out an inch or two apart each way. The majority of perennial Gentians make but little bulk the first season from seed, and to turn them out of doors in permanent quarters the first winter would be to court disaster; their enemies in the shape of slugs and other vermin would soon make short work of their small development of leaf and stem, and the action of frost mechanically on their tiny root-hold would be too trying an ordeal for them to pass through successfully. It is necessary, therefore, to winter them compactly together where they may be protected when required, and where vermin, when they appear, may be easily given good account of. If frames or hand-glasses cannot be spared for them, a bed of coal-ashes kept together by an edging of bricks or boards in some sheltered spot will do very well to winter in, the pots being plunged as much over the rims as is consistent with the safety of the plants, and a few hoops arched over the bed will furnish a suitable framework to support the protecting materials. The plants may be turned out into their permanent places the following spring.

G. acaulis (*Gentianella*).—A very lovely plant, familiar in

most gardens. It is so well known that description would be superfluous, and its uses as an edging-plant for walks, beds, or alleys, and for planting in masses upon banks, or in rounded, slightly-raised patches in the mixed border, or on rockwork, and its brilliant beauty in any or all of these positions, are too well known and appreciated to need remark or recommendation. It has long been a favourite with cottage and amateur gardeners ; and it is one of those gems that should be in every garden—it is so easily cultivated, and does so very generally well in all parts of the country. Yet accusations of fastidiousness as regards soil and situation have been brought against it often, and, as I think, undeservedly. I have seen the plant in every imaginable aspect and position, and in a great variety of soils, and very generally doing well. But it has likes and dislikes ; and very few plants that I know have a better right to protest in its own way against ill-usage ; they do not, however, amount to fastidiousness. It dislikes two extremes of soil—brick-clay and sand ; and it likes solidity, depth, moisture ; the latter especially during late spring and early summer, when it is making its growth ; but at all times perfect drainage is also liked ;—and if these very ordinary and reasonable conditions are attended to, the plant will amply reward, in April, May, and June, by the brilliancy and profusion of its deep-blue flowers. I would repeat, that solidity of soil is of the utmost importance to success with this as with every Gentian ; and deep moist loam it likes best. There is a variety having the tips of the segments of the corolla coloured greenish white ; as a novelty it has some merit, but for simple decoration it is inferior in effect to the normal blue. The plant is a native of mountain pastures in many parts of Europe.

G. asclepiadea (*Swallowwort-leaved G.*)—One of the most accommodating of Gentians, a native of bushy pastures on the Alps, the Vosges, and Apennines. It grows 1 foot or 2 feet high, erect and graceful. The stems are well clothed with stalkless, egg-shaped leaves, narrowing much toward the point, and distinctly five-veined. The flowers are produced in rather close spikes, usually in pairs, and almost stalkless, and are deep purplish-blue. A free-flowering, handsome border-plant, succeeding best in deep, rich, sandy loam. There is a fine white-flowered variety, which is equally easy to cultivate, and both may be used on rockwork ; only it must be remembered that the soil should be deep and moist.

G. cruciata (*Crosswort G.*)—Unlike the two last, and the majority of Gentians, this species has the corolla divided into four instead of five segments, giving the appearance of a cross

when open. Hence the significance of the name; but it is further descriptive of the arrangement of the leaves, which are rather closely packed in four rows along the stems. The flowers are deep blue, arranged in whorls or clusters in the axils at the upper ends of the stems. Height about 9 inches or 1 foot. Flowers in June and July. Native of dry mountain pastures on the great ranges of central and southern Europe. May be cultivated with little difficulty in any moderately good garden-loam, in the open border or rockwork; and is handsome and distinct.

G. gelida (*Pale-blue Siberian G.*)—A very beautiful species, growing about 1 foot high, with rather diffuse stems and lance-shaped leaves. The flowers are bright pale-blue, rather openly bell-shaped, produced in clusters in the axils of the upper leaves; appearing in June and July. Native of Siberia. Succeeds well in border or on rockwork, in moist peaty loam, sandy and well drained.

G. lutea (*Large Yellow G.*)—The roots of this species supply the greater bulk of bitter Gentian of the druggists. It is the largest and most bulky of the Gentians known to cultivation, reaching the height of 3 or 4 feet, with erect strong stems. The leaves are broadly egg-shaped and ample. The flowers are produced in dense whorls in the upper part of the stems, the full inflorescence having the appearance of a long-whorled spike. They are yellow, and appear in June and July. Native of high mountain meadows in central and southern Europe. It is a striking border-plant, both on account of the broad ample leaves and the inflorescence, which, though not so showy in colour as that of many, is very distinct. Very deep, rich, moist loam suits it best.

G. pneumonanthe (*Marsh G.*)—A British species, though not common. It grows about 9 inches or 1 foot high. The leaves are oblong lance-shaped. Flowers long, deep blue, lined on the outside with green, produced in the axils in the upper part of the stems, and appearing in August and September. Flourishes best in rich, peaty, sandy loam, moist, but well drained; and succeeds in either border or rockwork. It is a very common plant in moist pastures in hilly countries throughout Europe and northern Asia.

G. punctata (*Yellow-spotted G.*)—A strong-growing plant about 2 feet high, with erect strong stems. The leaves are oval, on short stalks. The flowers are produced in clusters at the extremities of the stems, and are pale yellow spotted with purple. Flowers in June and July. The plant is a native of high alpine pastures on the great mountain-ranges of Europe. It succeeds well in the mixed border in deep sandy loam.

G. pyrenaica (*Pyrenean G.*)—This is one of the high alpine species. It grows only a few inches high, with branching, spreading stems. The leaves are narrow lance-shaped. The flowers are deep blue, divided into ten segments, each alternate one being smaller and more angular than the principal or representative five. They appear in June and July. Native of lofty stations on the Pyrenees.

G. saponaria (*Soapwort-leaved G.*)—A good and accommodating border-plant, growing 1 or 2 feet high. The stems are ascending, and clothed with broadly-lance-shaped leaves. The flowers are stalkless, in rather close heads at the extremities of the stems; they are blue and barrel-shaped, being almost closed at the mouth, which is cut into ten nearly equal segments. They appear in August and September. Native of North America. This is one of the most easily cultivated species, thriving in any ordinary garden-soil.

G. septemfida (*Crested G.*)—A very handsome species, suitable only for culture on rockwork, except where moist peaty borders exist, when it may be successfully grown on the level; but it delights most in peat, or sandy loam and peat, whatsoever station it may occupy. The plant forms tufts about 9 inches high. The leaves are lance-shaped, rather broadly so, and distinctly three-veined. The flowers are large, bright blue, with a white-and-blue spotted throat; and the smaller alternate segments are finely cut. Flowers in August and September. Native of the Caucasus.

G. verna (*Vernal G.*)—One of the smallest and most beautiful of Gentians. It grows only 1 or 2 inches high, and has the same close matting style of growth as *G. acaulis*; but is even more dense and compact than that plant. The leaves are hard, small, and oblong in shape. The flowers are borne on short stems, often barely carrying the whole length of the tube of the flower above the mat of leaves; they are funnel-shaped, and divided at the mouth in five spreading, rather broad lobes, having intermediate and smaller lobes, slightly cut or crested, between. They appear in April and May. The plant is a native of high alpine pastures, and is often coddled and vexed to death in cultivation. Although a tiny plant, it requires a deep, rich, cool, sandy loam to grow in, and a good open exposure; and, like all, or nearly all, Gentians, water in abundance is necessary during the growing season. The rockwork is the best place for it, where, if the natural soil is not what it flourishes best in, a suitable compost may be provided for it; but if suitable, it may be tried with every confidence in the open border.

Linnanthemum nymphæoides, syn. **Villarsia nymphæoides**.

—An elegant aquatic plant, found in many parts of Britain and Ireland, but supposed to have been introduced, and not native. It forms widely-extending immersed stems, rooting freely below, and branching at the extremities; the branches ascending to the surface of the water, and terminating in a tuft of leaves, deeply heart-shaped, on long stalks, and floating on the surface. The flowers are large, bright yellow, on long stalks; appearing above water in June, July, and August. It may easily be introduced into pieces of water, natural or artificial, by procuring divisions and immersing them, and otherwise treating them as described already for Water-Lilies; and seed, if more handy, may be treated in precisely the same way, taking care to sow them as soon as ripe.

Menyanthes trifoliata (*Buckbean*, or *Marsh Trefoil*).—This is a beautiful and fragrant plant, and a common native of Britain—in shallow streams or pools, and very wet marshy ground or bogs. The plant forms strong, creeping, rooting stems, in deeper water often floating. The leaves are trifoliate, on long stout stalks; the leaflets large, oval, or oblong. The flowers are borne on stout stalks, varying in length with the depth of the water from 6 inches to 1 foot or more. They are arranged in handsome racemes, and the corolla is deeply cleft into five lobes, and beautifully fringed; on the inside it is white, suffused with pink outside. It will be found easy to establish wherever the necessary conditions of its existence—shallow water or bog—are available, by introducing pieces of the stems, and securing them till, by the emission of roots, they have secured themselves.

Spigelia marilandica (*Perennial Wormgrass*).—This is a lovely plant, very rare in cultivation, and difficult to keep unless the circumstances are most favourable. It is a native of moist warm woods in North America, ranging over a considerable extent of the country, and luxuriates in the rich, deep, vegetable mould formed by the decomposed annual clothing of many generations of trees. The nearest approach to this that we can make in cultivation is a mixture of peat and loam, with abundance of sand. Considerable depth of soil is required; and it should be well drained, but well supplied with water during the hot months of summer. The plant likes a warm position, and also a little shade; but if so placed on rockwork as to enjoy a screen for an hour or two during the hottest part of the day, it will be quite sufficient. Shelter also is required from cutting winds; and the means adopted to secure this, whether by planting in hollows protected by either ledges or

bushes, may be so adjusted as to afford the necessary amount of shade. Propagation may be effected by carefully dividing the roots; but it is one of those subjects which, when doing well, should not lightly be disturbed. The plant grows about 1 foot or 18 inches high, with numerous erect simple stems. The leaves are very broadly lance-shaped or acutely oval. The flowers are long, tubular, brilliant scarlet externally, and yellow within; but little of this is seen except on close examination, the external colour being that which is conspicuous; and the tube is divided at the mouth into five acute segments. They are borne in small clusters in the axils of the upper part of the stem, and appear in July and August.

POLEMONIACEÆ.

A small family, but an important one to flower-gardeners, for we could ill do without our Phloxes. There are only three genera of hardy Phloxworts represented in cultivation at present, so far as I know. They are *Cyananthus*, *Phlox*, and *Polemonium*. The first is represented by a rare and solitary but very pretty species; the second is familiar to every one who has to do with gardens in any way through the popular florists' varieties; and the last is best known by its old-fashioned representative Jacob's Ladder, *Polemonium cæruleum*. The species are mostly plants of some ornamental value; and some, along with their varieties, are splendid or very showy free-flowering subjects.

Cyananthus lobatus (*Lobed-leaved C.*)—A native of lofty elevations on the Himalayas, perfectly hardy, but very impatient of damp. It forms diffuse spreading tufts 6 to 9 inches high, the stems branching freely, and clothed with small lobed and much-toothed leaves, and both stems and leaves are thinly covered with soft hairs. The flowers appear at the ends of the branches, are not large, but Phlox-like, and divided deeply into five broadish-bearded lobes, and beautiful soft blue. The flowers begin to open in early summer, and continue, never very profusely but continuously, to open throughout summer, and often into autumn. The plant is only capable of enduring our winters on warm dry rockwork, or it may be secured over winter by putting a few cuttings early in autumn in pots, in sandy soil, in a cold frame, to be kept dryish during winter. It flourishes best in deep sandy loam and peat, and delights in

abundant moisture during the growing season, but the drainage ought to be very perfect.

Phlox.—This is one of the most numerous of the groups of this order, and in so far as the varieties of the late-flowering taller species are concerned it is a very familiar one, for the florists have been very successful in popularising it through them. The species from which these popular varieties have sprung—*paniculata*, *pyramidalis*, *suffruticosa*, and others—no longer exist in gardens; a fact that need not be mourned over, since they have left such a host of beauty in their offspring. These autumn-flowering Phloxes are indispensable to the mixed border, and amongst masses of shrubs their showy panicles have often a fine effect in distant pictures or scenes in places of large extent. They flourish in any ordinary garden-soil, but develop themselves best in moist but well-drained loam, rather strong than otherwise. They may be propagated by cuttings or division; the former is the best for obtaining fine panicles and flowers for show purposes, but the latter is the best way to obtain massive plants quickly for border or shrubbery decoration. They are the better of being occasionally lifted and replanted; this may be done with the best results every year, if done in time—that is, not later than the beginning of March: it keeps the plants always vigorous, both in foliage and panicles; and at each successive planting care should be taken to sink the crowns a trifle lower than they were before. The florists will no doubt smile at my simplicity in these directions. I am quite content that they should do so, if they bear in mind at the same time that my instructions are directed towards the production of many stems and panicles rather than a few of excellent quality. There is another section of Phloxes more rare than these. I allude to the dwarf creeping or trailing species, flowering in spring or early summer. These are not much grown, but they are not less worthy of being cultivated than the tall kinds; indeed some of them rival these, both in the size, brilliancy, and profusion of their flowers, and their lowly habit renders them available for purposes that the others are unfit for. They are most useful for small or narrow borders and beds, and for the adornment of rockwork and sunny banks and dwarf stumps, in appropriate positions; and altogether they are select plants that may be associated with the more choice herbaceous and alpine perennials in many ways that will suggest themselves in different circumstances. Their culture is quite as simple as that of the taller Phloxes; for although they partake of the character of alpine plants as to stature, they have none of the fastidiousness of some of the

best of these as regards soil and situation. They all like peat or leaf-mould well decomposed, but they grow and flower very freely in any well-drained garden-soil; though, if it is a heavy loam or clay, while they will not refuse to grow in it, they do not flower so freely as in lighter or sandy loam: it is well, therefore, in such cases, to mix both sand and peat or leaf-mould liberally with the natural soil before planting. All may be increased by division—some, such as *reptans*, very freely by this means, as every joint may be converted into a plant; and by cuttings, in cases where larger increase is necessary than would be quickly obtained by division. Cuttings are easily managed in a cold frame or hand-glass, or even in the open ground in sandy soil, in a shady sheltered corner.

P. canadensis (*Canadian P.*)—A very pretty plant, growing more erect and to a greater height than those to be afterwards described. It reaches the height of 9 inches or 1 foot, the stems being somewhat downy, and clothed thinly with broadly-lance-shaped leaves. The flowers are purplish lilac, in rather compact panicles, appearing in April and May. The plant might be made use of in spring bedding-out, but it is chiefly valuable as a handsome subject for front lines of mixed borders.

P. frondosa (*Frondose P.*)—A very neat and compact prostrate plant, forming dark-green carpets of broadly-linear rather blunt-pointed leaves. The flowers are pink, and appear in April, May, and June; and the whole plant does not exceed 6 inches high. Native of North America.

P. reptans (*Creeping P.*)—The handsomest, as it is also the freest to grow and flower, of the prostrate Phloxes. It grows about 6 inches high, spreading wide by means of its rooting stems, and throws the trusses of beautiful reddish-purple flowers slightly above the carpet of oval leaves. It labours under several *aliases*—viz., *P. verna* and *P. stolonifera*, and is best known in Scotland by the first of these. There is a variety with thicker leaves, but otherwise differing little from the normal state of the plant, to be met with occasionally doing duty as a species under the name *crassifolia*. Native of North America.

P. setacea (*Bristled P.*)—A very charming lowly plant, more suitable for rockwork than borders, unless the soil is light and warm, but at the same time moist during summer. It forms very dwarf tufts of matted branches, densely clothed with bristle-like leaves. The flowers are small, in compact trusses, and pale pink. There is a snow-white variety, which in nurseries and private gardens is named *P. nivalis*; it is a pretty but rare

thing, and rather more delicate than the species. Native of North America. Flowers in April and May.

P. subulata (*Awl-leaved P.*).—Nearly related to the last. It has a similar matted but more extending growth. The leaves are awl-shaped, terminating in a sharp hard point. The flowers pink, rather larger than in the last, but appearing about the same time. The *P. Nelsonii* is a fine white-flowered variety of this species. Both require the same conditions as regards soil as the last. Native of North America.

P. suaveolens variegata.—This is an erect-growing plant, about 2 feet high, with panicles of white flowers, and pretty lance-shaped shining leaves variegated with white. It is a choice variegation, and worthy of a place in the most select collections.

Polemonium (*Greek-Valerian*).—This is a small genus of good border-plants, the best known of which is *P. cæruleum*, popularly named Jacob's Ladder, or Greek-Valerian. The species are mostly natives of North America, Europe, and northern Asia, and are all hardy plants, succeeding well in ordinary garden-soil, and may be readily propagated by division.

P. cæruleum (*Jacob's Ladder*).—A well-known plant, so well known as scarcely to require description. It has long been cultivated in gardens of all classes, but for a good many years it has been rarely seen in those of higher pretensions than the cottager or amateur, whose tastes inclined him to cling to old-fashioned border-plants. It is perhaps the best of the group for general border decoration, though not the only one worthy of being cultivated in larger collections. The plant grows about 2 feet high, producing masses of handsome pinnate leaves at the roots, a few of which clothe the erect flower-stems; the latter terminate in trusses of pretty soft blue flowers, which appear in June and July. Native of Britain and other countries of Europe, and of northern Asia and America. There is a handsome white-flowered variety, forming an excellent companion to the blue; and there is the still more handsome variegated-leaved form of the white-flowered sort, which no garden should be without. It is one of the most elegant of herbaceous plants, having all the grace of form of a delicate Fern, along with a distinct and beautiful variegation. It is now much used in flower-gardening in many ways, and its fine colouring and outline render it most valuable in the bedding system, and as a mixed border or rock plant it is always attractive and pretty. It succeeds best in moist deep loam, and altogether does better in a moist position than a dry one. In damp cold localities, however, though the plant endures the winter well out of doors,

yet it is very apt to start away green in spring. This can only be obviated by lifting the plants in autumn or early winter and storing them in a drier and warmer position, either out of doors or under cover of glass, or cover of any kind that may be put on during rain or snow, or very severe frost, and removed at other times. It should be cultivated for the sake of the handsome foliage alone ; and if any indication of flowering manifests itself, the centre of the stem should be pinched out at once, as the development of the flower-stems, if allowed, will lead to deterioration of the leaves, and not unfrequently also the loss of the plant altogether in dry soils or seasons. Even if left out of doors it is benefited by being annually transplanted into new or fresh soil, and by being divided : this to a considerable extent prevents attempts at flowering, and the more thorough the division, the more effectually it does so ; but of course the process will be regulated by the necessity for increase in each individual case ; and it should be stated, that without some assistance from artificial heat, very minute divisions do not make much bulk the first season.

P. pulcherrimum (*Prettiest Greek-Valerian*).—A dwarfer plant than the last, reaching at the most only about 1 foot high. It makes a more sparing development of leaves, which are pinnate as in the last, but with smaller and blunter leaflets. The flowers also are smaller, in rather denser trusses, are bright blue, and appear throughout the greater part of summer and autumn. Native of North America.

P. Richardsonii (*Richardson's Greek-Valerian*).—This is a neat and pretty plant, forming attractive tufts of bright-green pinnate leaves, consisting of ten or more small oval leaflets. The flower-stems rise about 6 or 9 inches high, and terminate in a few rather large pale-blue flowers. They appear in succession throughout summer and autumn. Native of North America.

Besides these the two species *humile* and *reptans* are well worth growing. Both are dwarf plants, adapted for culture on rockwork or the front line of mixed borders. The latter flowers in spring, the other throughout summer and autumn, and both are blue-flowered.

CONVOLVULACEÆ.

This is not an important order in so far as the hardy perennial species are concerned ; they are few and not very well

favoured. Some are rampant climbing plants, beautiful enough in their season, but so encroaching and weed-like in their tendency as to have brought them very justly into general disrepute amongst cultivators. But some of those rampant species may be turned to account in the ornamentation of open woods and half-kept places. They may very properly be associated with the Hop and plants of similar habit, with a view to the production of characteristic effects in wild spots about large places. There are very few of the neatest and dwarfest perennial species hardy in all parts of the country, though a few of them are very beautiful plants. The hardy perennial species of the order are usually divided or ranged under the generic names *Calystegia* and *Convolvulus*, the former being distinguished from the latter by the presence of bracts underneath the calyx,—a distinction that may be regarded troublesome in the garden, however essential it may be in the herbarium; and on that assumption we may, without doing much outrage to science, be permitted here to apply the latter name to all of the few species which our limited selection embraces. They all grow freely in rich rather sandy soil, and are easily propagated by division of the roots.

Convolvulus althæoides (*Althæa-like C.*)—This is a dwarf trailing or diffuse species about 1 foot high. The lower leaves are heart-shaped, lobed, and toothed, and covered with close-lying silky hairs. The flowers are handsome and freely produced from early summer till late autumn, and are soft rosy-pink. Native of the Levant.

C. lineatus (*Dwarf C.*)—This is a neat and pretty plant, conspicuously silky in all its parts. It grows about 6 inches high, producing lance-shaped leaves on short stalks. The flowers are pink or pale red, appearing in early summer. Native of the south of Europe. Adapted best for culture on rockwork.

C. pubescens flore-pleno.—A very handsome and useful plant for clothing trellises, stumps, porches, and general rustic-work. It grows rapidly to the height of a good many feet, though not so extending as the following and some other sorts. The leaves are large, somewhat spear-head-shaped, and softly downy. The flowers are large, double, and pale rose. Native of China. Flowers in June, continuing for some months.

C. sepium (*Great Bindweed*).—A very vigorous rapidly-extending plant, to be tolerated only where it cannot encroach upon and destroy anything better or weaker. It is quite like the last in growth and general appearance. The flowers are white, appearing in June, and lasting the greater part of sum-

mer and autumn, and there is a pleasing flesh-coloured variety. Native of Britain.

C. Soldanella (*Sea C.*)—A most distinct and pretty plant, growing about 1 foot high, with round or kidney-shaped leaves, having broadish lobes at the base. The flowers are large, pale rose or pink, and open in June and July. Native of the sandy coasts of the United Kingdom, and of like habitats in many other countries of the different quarters of the earth. A very good border-plant, succeeding best in light sandy soil.

BORAGINACEÆ.

There are not many very valuable perennial herbaceous plants in this order, notwithstanding it is almost entirely composed of herbaceous species; but there are a few species of different genera worthy of cultivation in the most select collections—choice things a few of them, which no collection should be without. Others, such as the larger *Symphytums* and *Anchusas*, are too coarse for the finer purposes of decoration, but are very useful for introducing into woods and other rustic situations, with a view to naturalising them there.

Anchusa (*Alkanet*).—A rather coarse-growing group, well adapted for introducing and naturalising in semi-wild places, as open stony banks and glades in woods, where, if once established, they will take care of themselves. They are not particular as to soil, and are easily propagated by division and by seed.

A. officinalis (*Common Alkanet*).—A short-lived perennial, often biennial, but propagating itself freely from seed. It grows about 2 feet high, the whole plant covered with the rough bristly hairs so characteristic of this order. Leaves usually broadly lance-shaped. Flowers in one-sided forked spikes, and a peculiarly rich blue, appearing throughout summer and autumn. Native of Britain and other countries of Europe, and the Caucasus.

A. sempervirens (*Evergreen Alkanet*).—The last is rather a stiff erect plant. This one is more straggling, and reaches the height of about 18 inches. The leaves are broad, egg-shaped, and these and nearly every part of the plant are covered with coarse bristles. Flowers in the same way, and similar in colour to the last. Native of Britain and western Europe. Though indigenous plants, neither of the two are common in

a wild state. Any of the other hardy European or Asiatic species may be used in the same way, but none of them are worthy of a place in a select mixed border, and all are too gross for the rockwork.

Arnebia echioides, *syns.* **Anchusa echioides** and **Lithospermum erectum**.—A very handsome plant, with erect stems, terminating in a bold compact truss of purple and yellow flowers. The leaves are oblong, clothed as is the stem with conspicuous hairs. Flowers in early summer, continuing for a couple of months. Height about 18 inches. Native of the Caucasus. A handsome border-plant, not easy to keep. Succeeds best in rich light loam or sandy peat and loam. Propagate by cuttings and by seed.

Eritrichium nanus.—This is, so far as I am aware, the only species. It is a lovely, rather dense-growing, diminutive, and somewhat delicate alpine plant, reaching only 3 or 4 inches above ground. The leaves are lance-shaped and densely hairy, as is nearly every other part of the plant. It blooms very freely, the flowers being produced singly, and are deep azure blue, opening in June and lasting for some weeks. It is a native of lofty stations on the Alps, bordering on the extreme limits of vegetation, and during the short period of activity it enjoys it is drenched with snow-drip. It is very rare in cultivation, and our experience of it is limited; but, like other subjects from like habitats, it must be treated to the nearest imitation of its natural circumstances that we can attain to in art. A thoroughly well-drained yet moist position on rockwork during the growing period, and a long and dry rest period, would be the most likely treatment; and the soil should be porous sandy loam and peat, the sand predominating, and the whole compact.

Lithospermum (*Gromwell*).—A very pretty genus of neat-growing plants, some of which are somewhat shrubby in character. They succeed best in light, well-drained, sandy loam, and are propagated by division and cuttings and seed.

L. prostratum (*Prostrate Gromwell*).—A very pleasing and pretty spreading prostrate plant, with woody branches and stems. The leaves are narrow, lance-shaped, and hairy. The flowers are borne in small terminal panicles, and are deep blue with a dash of red. They open in May and June. The plant will succeed alike well in border or rockwork if well drained.

L. purpureo-cæruleum (*Creeping Gromwell*).—A prostrate plant, but often attaining the height of 9 inches or 1 foot in dry, deep, rich loam. The plant sends out numerous prostrate main stems, which extend in luxuriant individuals 2 or 3 feet.

The flower-stems are erect, clothed with lance-shaped sharply-pointed leaves, rather roughly hairy. The flowers few together at the points of the branches. They open in early summer, and continue long. A very handsome plant in border or rock-work, and desirable to naturalise on dry banks in open woods, in which way it is likely to succeed well. Native of Britain, but rare, and southern Europe.

Mertensia virginica, syn. **Pulmonaria virginica**.—A very handsome and distinct border-plant, better known under the synonymic than the name now applied to it. It grows 1 foot or 18 inches high. The root-leaves are elliptical in shape, quite smooth, and pale green or glaucous in maturity, but in the early stages of growth pale or livid purple. The stem-leaves are smaller, but the same shape and colour. The flowers appear in May and continue for some weeks, and are beautiful blue, in pendent racemes or panicles at the ends of the shoots. Flourishes best in moist good loam, but is not over-particular as to soil if the necessary moisture is present. Propagate by division. Native of North America.

Myosotis (*Forget-me-not*).—This is a familiar group, and much admired for their humble but attractive profusion of flower. They are plants of the simplest habits as regards culture. Most of them are bad perennials, that are apt to wear themselves out in a year or two if not timeously attended to in the matters of lifting and replanting, and refreshing the soil in the spots they occupy. It is well to attend to this regularly annually, and it is best done immediately flowering is done. In the case of certain species it will be necessary to remark more particularly on their treatment in the proper place. They succeed generally best in good rich loam, rather moist and light, and are propagated by seed, cuttings, or division.

M. alpestris (*Alpine Forget-me-not*).—The doctors are not agreed as to whether this is a good species or a marked variety of *M. sylvatica*; some of the authorities hold one view and some the other. It is not a point of much consequence to those who are looking for and anxious to meet with distinct ornamental plants, and those disposed to satisfy themselves on the scientific question will find the reasons *pro* and *con* in the various floras of this country and the Continent. It is quite distinct as a garden ornament, as well as superior to the best forms of *sylvatica*. The plant, even when most luxuriant, is only a few inches high. The leaves are rather roughly hairy, on longish narrow stalks, and dark green. The flowers are as large or larger than those of the common Forget-me-not, and usually succeed those of *sylvatica* in the time of opening, which

is about May or June, and continue for some time. Succeeds best in light sandy loam in moderate shade, and is most easily managed on rockwork, or when a few stones are put about its roots in the borders. A rare native of Britain, and more common on the mountains of the Continent. An attentive eye should be kept on its condition after flowering; and a little stock should be raised annually from seed or by division, but seedlings are always most vigorous.

M. azorica (*Azorean Forget-me-not*).—For general border decoration this is perhaps the best Forget-me-not in cultivation. It is very distinct in habit and colour of flowers from all others, and is perfectly hardy in well-drained soil, though there is a general impression that it is not so. The plant grows from 6 to 9 inches high, erect and compact, not throwing out creeping stems, as some species do. The stems are clothed with oval lance-shaped leaves, which, along with the stems, are roughly hairy. The flowers are borne in compact terminal trusses, are at first reddish purple, afterwards changing to deep blue. They begin to appear in May, and continue in moist situations, or if well attended to with water in dry weather, the greater part of the summer. It is easily increased by division, cuttings, or seed; and well-established plants are benefited by being annually transplanted in early spring.

M. dissitiflora (*Loose-flowering Forget-me-not*).—This plant is better known under the name *montana* than that applied to it recently by Mr Baker. It is distinct from both *montana* and *sylvatica*, at least for garden or decorative use, although in many points they closely resemble each other. This flowers or begins to flower in the earliest spring months. In most respects it closely resembles *sylvatica*, and like it is a perennial of short duration or biennial tendency, and is best treated as a biennial by being raised annually from seed. It is invaluable as a spring bedding plant, or wherever spring flowers are much valued; and in the latter case it should be naturalised on all desirable spots, which will be an easy matter if the soil is tolerably good and moist, for it will then sow itself freely, but not easily in dry gravelly ground in exposed places.

M. palustris (*Common Forget-me-not*).—A plant so beautiful and so abundant in moist places all over the country as this requires no description and as little remark, unless it be to express astonishment that a subject so much admired in nature should be so much neglected in cultivation. Too little of it is seen about most gardens. It grows very freely in any good loam; but of course in dry soils, as might be expected in a plant inhabiting the wet positions in which it is most frequently

seen in nature, it does not do well for any length of time. It is a very proper subject, too, for naturalising where it does not already exist, about the banks of streams and all moist or wet spots where it may be desired. Its vigour is improved, when cultivated in borders or beds, by annual lifting and replanting, digging and refreshing the soil at the same time; and it should be done in early spring.

M. sylvatica (*Wood Forget-me-not*).—A very beautiful plant when grown in masses; but too thin, when only one plant may be viewed as in a mixed border, to be very much admired. It grows 1 foot high or more, with lance-shaped hairy leaves, the stems also being hairy. The flowers are beautiful azure blue, in racemes several inches long, and begin to open in the late spring and early summer months. The same cultural treatment as *dissitiflora*, and useful for the same purposes. Native of Britain and other countries of Europe, and the colder regions of Asia.

Onosma tauricum (*Golden-Flowered O.*)—This is not the only species, but it is certainly the best in cultivation. It is an elegantly pretty plant, growing from 6 to 9 inches high, and forming compact tufts. The leaves are lance-shaped, roughly hairy. The flowers are somewhat barrel-shaped and bright golden yellow, in terminal drooping trusses, appearing in late spring and early summer. Native of the Caucasus. The plant is adapted to the rockwork or border in rich light loam, and is partial to a little peat. Propagate by cuttings and by seed—not easily by division; indeed it is not advisable to resort to that method except in the case of those of experience.

Omphalodes verna (*Venus Navelwort*).—A very pretty and not uncommon plant in gardens, resembling in the colour and form of the beautiful flowers some of the Forget-me-nots; but there the resemblance stops, for the leaves and habit are not to be confounded by the least knowing in plant-lore. The plant forms dense spreading masses of bright-green egg-shaped leaves, quite smooth, on the surface of which lie the lovely azure-blue white-eyed flowers, which begin to appear in March or April, and in moist or tolerably rich soil continue in greater or less profusion for the greater part of summer. The plant is not fastidious as to soil, and is easily propagated by division.

Pulmonaria (*Lungwort*).—A pretty numerous group, very few of which are in cultivation. They succeed well in most garden-soils, preferring that which is rich and tolerably moist, and preferring also a little shade. Propagate by division.

P. davurica (*Daurian Lungwort*).—This species grows about 9 inches to 1 foot high. The leaves are produced in dense

masses at the roots, and are egg-shaped, with a heart-shaped base, and clothed with dense roughish hairs. The flowers are borne in terminal panicles, and are light blue, with a dash of red on opening, appearing in early summer. Native of the mountains of Dauria, and well fitted for border decoration.

P. officinalis (*Common Lungwort*).—A well-known inhabitant of cottage-gardens, and generally of the herbaceous borders of all gardens in which such borders are permitted. The large spotted-leaved form is too well known to require description, and is, when the best variety, a plant worthy of a place in any garden; but there are inferior varieties passed about under the same name, for it is a variable species, and some of these are not worth growing if the best can be got. The *P. angustifolia* of the catalogues is a less ornamental form, with narrower and usually spotless leaves. The flowers of all the forms of the species are borne in forked panicles, usually opening pink or reddish, and shading into different tints of blue. They appear in spring and early summer.

Symphytum (*Comfrey*).—This group is mainly composed of bold-growing, rather coarse plants, adapted for the adornment of open woods and semi-wild places, but neither sufficiently showy nor refined for borders of an ornamental character. They flourish in any common soil, preferring that which is moist, and are propagated by division.

S. asperrium (*Roughest Comfrey*).—A large coarse plant with large, roughly-hairy, broad, egg-shaped or lance-shaped leaves. The flowers are red and purple, or blue, appearing in early summer and continuing to the end. Height 3 or 4 feet. Native of the Caucasus.

S. bohemicum (*Bohemian Comfrey*).—This is a fine species, worthy of a place in select mixed borders, and a very handsome and desirable plant. In good moist sandy loam it grows to the height of about 2 feet, producing broadly-lance-shaped leaves and fine drooping trusses of handsome crimson flowers, which open in the beginning of summer and last a month or two. The name *coccineum*, which this plant bears in some gardens, is an erroneous one, for which I can find no authority.

S. caucasicum (*Caucasian Comfrey*).—A good dwarf border species, making considerable development of procumbent stems and foliage. The flowers are deep or purplish blue, appearing in the later spring and early summer months. Native of the Caucasus.

S. officinalis (*Common Comfrey*).—In moist soil this grows 3 or more feet high, with strong erect stems amply clothed with long and broad lance-shaped, roughly-hairy leaves. It is

one of the least valuable in its normal state for ornamental purposes, the flowers being ineffective dull yellow. There is a purple-flowered variety, more ornamental; but both these are only fit for the most common use in decorating woods and the banks of streams, or suchlike places. There is, however, an important variegated form worthy of a place in mixed borders, and might be used with good effect in large borders and beds in bedding out, as the variegation is decided and distinct, and the foliage ample.

SOLANACEÆ.

There is very little in this order that may be considered good ornamental perennials and hardy, but there are one or two which we cannot pass by without some notice, although it need take up but little time and space.

Physalis Alkekengi (*Winter Cherry*).—A not uncommon plant in old-fashioned gardens, valuable solely on account of its pretty fruit, which resembles a red cherry very much in colour and size. The fruit is very useful in early winter for room and table decoration, where that is in demand; and for this purpose the plant should be grown in beds or patches sufficiently large to meet the required supply. The plant may also be used in the mixed border; but except in very extensive collections it may well be dispensed with, for its beauty requires to be looked for, as the berries are enclosed in the inflated bladder-like calyx. Flourishes best in dry warm soil and a sunny situation. Propagate very freely by division.

Physochlaina.—Two or three species of this genus are known to cultivation, but very rarely beyond the precincts of botanic gardens, or a few large private collections. They are useful early spring or summer flowering plants, though not exactly what would be termed first-rate ornamental subjects; still they are quite hardy, and being accommodating as regards soil and situation, and sufficiently beautiful for border decoration, they are desirable plants where room may be spared them.

P. grandiflora (*Large-Flowered P.*)—The plant grows about 1 foot high, forming rather dense masses of dark-green, egg-shaped, glutinous, hairy leaves. The flowers are borne in terminal panicles, and are longish, bell-shaped, pale yellow, and veined with livid purple. The flowers appear in April and May. Native of Thibet.

P. orientalis (*Purple P.*)—This species grows about 1 foot or 18 inches high. The leaves are broadly egg-shaped, and form rather dense masses. The flowers, smaller than those of the last species, are in compact head-like panicles, and dark purple. They appear simultaneously with those of the last. Native of Iberia.

Ramondia pyrenaica (*Pyrenean R.*, syn. *Verbascum Myconi*).—This is a handsome little alpine plant. It grows a few inches high, forming flat masses of roundish heart-shaped, much-wrinkled, notched, and toothed leaves, clothed on the upper side with shaggy hairs, and below with rusty down. The flowers are borne on short stalks in few-flowered panicles—are deep purple with a yellow eye. Flowers in May and June. It flourishes best in moist shady nooks about rockwork. The drainage should be thorough, and the soil good sandy loam and peat, the latter predominating. Propagate by division and by seed. Native of the Pyrenees.

Verbascum (*Mullein*).—A large genus of striking and in many cases handsome plants. The greater part are, however, biennials or perennials of very uncertain duration, many of which establish themselves freely, and abundantly provide for their propagation and perpetuation in a place by means of the large quantities of seed which they annually produce and scatter about. They are only fit for naturalising in woods and such-like places, and rocky spots where they may find sufficient depth of soil in the fissures to support their often gigantic growth. The following few species are some of the more permanent perennial kinds, and are worthy of a place in wide borders, in the back lines of which they produce a very good effect; and they are very good for working in amongst masses of shrubs, and the borders surrounding beds of these. They succeed in any good garden-soil, and are readily increased by division, which has an invigorating effect when the process is attended to before the plants become debilitated too much, which is apt to be the case if they remain many years in the same spot, especially in wet soils; and they all ripen more or less of seed, which offers another ready means of increase.

V. nigrum (*Black mullein*).—The quality of the specific name does not apply to the flowers, but the roots. The plant grows 2 or 3 feet high, often more in congenial soil. The leaves are heart-shaped, and stalked on the lower part of the stem, and diminish in size and the length of the stalk as they ascend, till they become quite stalkless. The flowers are in long racemes, in weak plants commonly unbranched, but more or less branched in those that are luxuriant. They are yellow, with purple-haired

stamens, and appear in early summer, and continue for some months. Native of Britain, other countries of Europe, and western Asia. There are numerous hybrids of this plant differing in habit, foliage, stature, and the colour of the flowers, but I have met with none superior to the typical form for border decoration.

V. phœnicum (*Purple Mullein*).—A very distinct plant, and excellent border ornament. The leaves are mostly confined to the roots and the base of the stems. They are dark-green, with a dash of purple on them, but destitute of hairs. The stems are weak, at first erect, but in the process of growth becoming straggling. The flowers are in very long slender racemes, very numerous, and dark bronze purple. There are several hybrids and varieties of this plant in gardens, some of which are well worth a place along with the type, the most valuable being the white and the red flowered. Height 2 or more feet. Flowers appear in June, and continue for some months. Native of the south of Europe.

SCROPHULARIACEÆ.

This is a very important tribe of plants in floriculture, comprising as it does the *Calceolaria*, the *Pentstemon*, *Mimulus*, and many other showy genera with which we are more or less familiar, and not a few that are not very generally known outside botanical gardens.

Antirrhinum (*Snaf-Dragon*).—This genus is so familiar to all who have anything to do with gardens or flowers, and so generally admired, that in so far as the most common species is concerned, there is no need for description or praise, as it is long and unassailably established in favour. There are other species, but all are inferior in usefulness and beauty to *A. majus* in all its variety.

A. Asarina (*Italian Snaf-Dragon*).—A very distinct and attractive plant, but unfortunately not easily cultivated in most parts of the country. It is not advisable to attempt its culture in borders or other flat surfaces in any part of the country, but on rockwork it may be grown with satisfaction in all the more favoured districts; in the north, however, it will require to be kept in pots and treated as a half-hardy alpine. It is a prostrate creeping plant with feeble stems, rather thinly clothed with roundly-heart-shaped, hairy, somewhat viscid, irregularly-

toothed leaves, in the axils of which appear the handsome creamy-white flowers in June and July. It is fond of a chalky soil, rather dry than otherwise, and should be kept dry in winter, whether in pots or in the open air. Native of the Pyrenees. Propagate by cuttings and seed.

A. majus (*Common Snap-Dragon or Antirrhinum*).—As already said, this plant is too well known to require description or praise. Its use and value as an ornamental plant are well understood and valued. While it is willing to grow and increase itself by means of seed anywhere in the most unlikely places—in the thinnest soil, or even lime-rubbish or gravel, on walls and house-tops—it is very grateful in better circumstances, and forms one of the handsomest of border ornaments. It succeeds best in well-drained rich sandy loam. Its propagation by seed is a very simple matter: the plant, wherever it is grown, demonstrates that fact by the multitude of seedlings that spring up around it; but it is often desirable to perpetuate choice and well-marked varieties, and that cannot be done by seed. Cuttings are the only means whereby that end may be attained, and they may be put in, in sandy soil, in a cold frame or hand-light in autumn or spring, and kept shaded from bright sunshine for some time till they begin to root; and they are best kept in some kind of shelter for the winter, if struck in autumn, which is the best season for laying in increase of stock; for though sufficiently capable of resisting cold, they are not so successful in enduring wet, especially in combination with frost. A naturalised inhabitant of many parts of Britain and Ireland, but originally from countries of the Mediterranean.

Calceolaria (*Slipperwort*).—Of this fine and popular genus there is only one subject, so far as I am aware, that can be recommended as hardy with any degree of confidence. It is a hybrid raised about the year 1840 by Mr Kelly, propagator to Messrs Dickson & Son of Edinburgh. I do not know the parentage of the interesting and pretty plant, but it bears some resemblance to *C. plantaginea* in habit and flowers and foliage; and as that species is itself almost if not quite hardy, it may be presumed on these circumstances that it is one of the parents. Any way it is a valuable little plant worthy of extensive cultivation. It flourishes in border or rockwork in moist cool soil, and is perfectly hardy. Its name is *C. Kellyana*, and the flowers are yellow, with pretty crimson spots, and the plant is herbaceous, with smooth obovate coarsely-toothed leaves. Easily increased by cuttings or division.

Chelone.—This is a small genus of North American plants nearly allied to Pentstemon, but not so well known in private

gardens as some of the species and their varieties of that popular genus. They are, however, handsome border-plants of neat habit—not so showy as the hardy Pentstemons generally grown, but well deserving a place in mixed collections of ornamental plants.

C. Lyoni (*Lyon's C.*)—A plant of erect branching habit. The stems are thinly clothed with narrow, egg-shaped, sharply-toothed leaves on short stalks. The flowers are purplish red, in closely-packed terminal and axillary spikes. Height about 2 feet. Flowers in summer, and lasting till autumn. Flourishes best in rich, deep, sandy loam, and is fond of peat or well-decomposed leaf-mould. Propagate by division, cuttings, or seed.

C. obliqua (*Oblique-flowered C.*)—This species grows about the height of the last, with usually simple stems clothed thinly with short-stalked, lance-shaped, sharply-toothed leaves, arranged in opposite pairs or threes. The flowers are produced in close, short, terminal spikes, and are red or pale purple. The same treatment and propagation as the last.

Digitalis (*Foxglove*).—Not any of the perennial species of Foxglove that are in cultivation equal the common biennial one with which everybody is familiar. In passing it may be pointed out that it is a valuable plant for introducing in semi-wild places, and about ruins and stony places, where the seed may be scattered and left to the protection of nature. There are a good many perennials, good handsome border-plants, which, if they are not so showy, are also not so weedy as the biennial species, which, when introduced into dressed beds and borders, becomes quite troublesome by the freedom of its seeding and seedlings, which spring up in all directions. The perennials succeed best in very well drained yet tolerably moist loam, with a few roughish stones buried beneath them a little way. Propagate by division and seed.

D. ferruginea (*Rusty-flowered Foxglove*).—A tall plant, but variable in that respect, growing, however, in ordinarily good soil about 3 feet high. The leaves are oblong or lance-shaped, quite smooth, and dark green. The flowers are open, bell-shaped, bronze-coloured, and closely packed in long terminal racemes. They appear in July and August. Native of warm valleys in stony places on the lower mountains of Italy. It is not a very durable perennial, and is apt to die off after flowering, a thing that should be anticipated by saving and sowing a few seeds annually; and it ripens seed very freely, so that there need be no difficulty in keeping it up.

D. grandiflora (*Large-flowered Foxglove*).—This is a tall plant, having the leaves oblong or lance-shaped, slightly toothed, and

fringed with soft hairs. The flowers are in long racemes, and are widely bell-shaped, but longer in the tube than the last: they are yellow, veined with brown on the inside. Native of central Europe.

D. ochroleuca (*Pale-yellow Foxglove*).—An erect, rather strong-growing plant, about 3 feet high. The leaves are broadly lance-shaped, much narrowed at the point, and boldly toothed. The flowers are pale yellow, in long, rather loose, leafy racemes, appearing in summer, and lasting a couple of months. Native of central and southern Europe.

Erinus alpinus (*Alpine E.*)—A very pretty and interesting alpine plant, suitable only for culture on warm, moist, but well-drained rockwork, in rough, stony, or gritty peat and loam. The plant grows only a few inches high, forming little tufts of bright-green oblong leaves, widening a little upwards, and toothed at the points. The flowers in small flat trusses at first, but afterwards elongating into small loose racemes, are reddish purple, and appear in the early spring months. Native of the mountains of Switzerland and southern France. Propagate by seeds and division, and when established in congenial quarters it sows and increases itself freely.

Linaria (*Toad-flax*).—A very numerous family, mostly composed of annual plants, some of which are beautiful border ornaments; but there are also a few handsome and interesting perennials adapted for both border and rockwork ornamentation. They mostly succeed well in sandy well-drained loam; but where soil of a different kind is required it will be duly noticed afterwards. Many, indeed most of the species, ripen seed very freely, and by that means often increase themselves abundantly where they grow; but they may all be propagated by division.

L. alpina (*Alpine Toad-flax*).—A very neat and pretty, somewhat diffuse plant, growing about 6 inches high, the stems being clothed with glaucous linear leaves, usually four together. The flowers are blue, having two bright red spots on the lower lip of each corolla; they are produced in racemes, and appear in July, and continue for a month or two. Native of the Alps and Pyrenees, in gravelly and stony places. In cultivation the plant is only adapted for rockwork, and should have gritty moist soil and a moist situation. It is described as an annual or biennial in botanical works, but is a good enough perennial in cultivation; and, besides, seeds and sows itself freely wherever the conditions are favourable to its existence.

L. Cymbalaria (*Ivy-leaved Toad-flax*).—This is a pretty little trailing species which has naturalised itself very freely all over

Britain, on walls and moist stony places, and is now included in our floras as a naturalised native. The leaves are roundly heart-shaped in outline, usually five-lobed and bright green. The flowers are produced singly in the axils of the leaves, and are various shades of purple; and some are white—that is, in individual plants. It is not a showy plant, but valuable for the facility with which it may be established in stony, moist, or shady spots, and on old walls or new as well. Easily increased by division or cuttings of the trailing stems. There is a good variegated-leaved form.

L. triornithophora (*Three-bird Toad-flax*).—This is a peculiar and beautiful plant, growing about 9 inches or 1 foot high, the stems somewhat decumbent. The leaves are lanceolate, in whorls, usually of three. The flowers are large, purple, and curiously formed, the divisions of the mouth of the corolla being arranged so as to suggest the idea of a little bird being perched on the stalks; the spurs, being long and conspicuous, complete the idea by furnishing the tails. They are arranged, as the leaves, in whorls of three, so that the specific name is fairly descriptive. It is only adapted for culture on rockwork, in well-drained sandy peat and loam. Flowers appear throughout summer and autumn. Native of Portugal.

L. vulgaris (*Common Toad-flax*).—The ordinary form of this wild plant, so common in many parts of Britain and Ireland, may not be deemed worthy of a place amongst choice ornamental plants, and yet it is a free-flowering and handsome object in cultivation, and not at all to be despised. There is a variety, however, at once curious and beautiful, named *L. v. Peloria*, which deserves a place in every collection of ornamental border-plants. It is by no means common in gardens, private or public, but should be both, on account of the abnormal structure of the corolla, and its continuous blooming quality. The plant grows about 1 foot high, with rather diffuse and often decumbent stems. The leaves are linear, glaucous, and crowded. The flowers are produced in crowded heads, and the corolla is regular and five-spurred, and bright yellow, appearing in early summer and lasting late. Succeeds in any well-drained good garden-soil in the open border, and easily increased by division.

Mimulus (*Monkey-flower*).—These are very gay free-flowering plants, admirably adapted for border ornamentation in any good garden-soil, but preferring a moist situation, and often doing well in shade or partial shade. For this reason they are well fitted for making gay borders on the shady side of shrubberies, but they do not long thrive if the shade is overhead.

They are easily increased by division or cuttings of the stems : every joint in the case of most species will grow.

M. cardinalis (*Scarlet M.*)—A very beautiful plant, worthy of being grown everywhere. It forms handsome tufts of rather erect stems, about 1 foot high, which are downy, and clothed with egg-shaped stem-clasping leaves, sharply toothed and downy. The flowers are produced on longish stalks in the axils of the leaves on the upper part of the stems. They appear in summer, and last till the end of autumn. Native of North America.

M. cupreus (*Coppery M.*)—This is a brilliant little subject of recent introduction. When first introduced its qualities as a bedding plant were strongly urged, and if the flowers were as continuous and sustained as they are profuse for a short time, it would be quite matchless : unfortunately, however, they are short-lived—the blaze, that is, is of very short duration ; and although a few flowers may be afterwards opened now and again, it is in a fitful and thin way that is unsatisfactory. It is a dwarf plant, about 6 to 9 inches high, with smooth opposite-toothed leaves, egg-shaped in form. The flowers are produced in dense masses, and are brilliant coppery crimson. There are now many varieties or so-called hybrids of it, with spotted flowers, and with differences of habit as well. It is fond of moist rich soil and moderate shade, but will grow and flower well in a sunny situation, only the display is not so lasting. Native of Chili. Flowers in the early summer months.

M. luteus (*Yellow M.*)—The endlessly-varied offspring of this species are the common Monkey-flowers, so well known and popular in cottage and other small gardens. They are beautiful border-plants, and by a little management may be had in bloom the round of spring, summer, and autumn. A few seeds sown where they are to grow, in March, April, July, and August, will keep up a constant succession of bloom ; and they seed so freely that there is never any difficulty in keeping up supply. The varieties vary in stature and colour : the dwarf or small cinabar-spotted are the neatest and most interesting ; but the taller, bolder, spotted-crimson kinds, are extremely showy for mere display. The latter appears to have had its origin as a race in a hybrid named *Youngii*, introduced about thirty years ago ; the others are of very recent origin. The species is no longer worth growing alongside its splendid progeny. It is a native of Chili.

M. moschatus (*Musk M.*)—The musk-plant is so well known that description would be superfluous. It is a great and worthy favourite with all, especially with the ladies. It has no claim

to be considered very ornamental ; but for the sake of its delicious odour it should be abundant in every garden, large or small, and it grows freely in every good garden-soil, but loves a little shade. Native of Columbia.

Ourisia coccinea (*Scarlet O.*)—A very handsome dwarf plant, forming tufts of dark-green, smooth, egg-shaped leaves, slightly cordate at the base, on hairy stalks a few inches long, and coarsely and bluntly toothed. The flowers are bright scarlet, appearing in the early summer months. Succeeds best in deep, rich, sandy loam, moist but well drained, and likes a little shade.

Pentstemon.—The merits of this genus for decorative purposes are of the highest order. Their flowers, fine in form and colour, combined with the characteristic elegance of their habit and inflorescence, mark them as especially attractive and beautiful. Few of the plants cultivated in our borders require less trouble and attention to insure an almost matchlessly lengthened succession of bloom, and none withstand battering rains and winds and early frost with less injury. A proper selection of species and varieties may be made that will secure a close succession of bloom during the greater part of summer and the whole autumn. They are too rarely seen in the gardens of the rich, but are yearly growing in favour with amateurs and cottagers, and the hardier kinds are undoubtedly most proper objects for them to lavish their care upon. Most of the hardier species are much inclined to sport and run into variation, a valuable peculiarity that is being turned to account, and results in the annual introduction of new sorts more or less distinguished from each other. "Choice hybrids" they are called in the catalogues ; but except that the races are the product of crossing by accident or design years ago, some two or three nearly allied species, themselves perhaps hybrids of nature, they have the least possible claim to be regarded as hybrids. They are mere seminal varieties, procured by selection conducted on careful principles, having a definite object in view. But this does not detract from the value of Pentstemons as garden ornaments ; it should rather add to it in the eyes of the lovers of flowers whose ways and means are simple and limited, because it presents an easy way of introducing as much novelty and variety as the nature of the process will admit, for by carefully saving seed from the best varieties in their own collections, they may procure a good deal of variation annually. But the improvement of the Pentstemon in this manner will be very limited, because only the existing popular races are operated upon. If we would have new races or

types we must call to our aid species that have as yet received no attention in this way. By doing so we may expect novelty in colours, habit, and stature, and it may be in hardiness also, which we do not possess but in the degree offered by the races contemplated at present. Florists have accomplished apparently more difficult tasks than that I have briefly hinted at, and they may do this if they are not entirely wedded to the trivial varieties that are annually sent out under new names, which are often their greatest distinction, and may have as their reward "choice hybrids" indeed, for which the purchasers will be truly grateful. It would be useless in a work like this to cumber it with lists or even allusions to popular varieties; it will be sufficient to remark that they are worthy of cultivation in every garden, and are indispensable for mixed borders and the adornment of shrubberies. They are most easily cultivated in so far as relates to the varieties and many species; but it must be admitted that a few of the latter are difficult to keep in cultivation, a circumstance that accounts for their rarity in even botanical gardens, and their almost total absence from private ones. The requirements of these will be dealt with when they turn up in the selection, but the general culture of the others will be best given here. Pentstemons like a good rich soil and a good open sunny exposure to grow in, and the ground should be well dug early and deep, so as to insure thorough pulverisation. Many plants in mild warm localities will endure the winter and flower early and well the following year, but the flowers deteriorate in quality, and the duration of the blooming period is shorter, or is not so profuse if prolonged. The best late summer and autumn display is procured from cuttings struck the previous autumn. The cuttings are easily managed, if a cold frame or hand-light can be devoted to their use, and they should be treated in exactly the same way as shrubby Calceolarias, only they must, if possible, be put in earlier. As early as cuttings can be got in September, they may be taken after being made, which is a simple matter, consisting in the removal clean away of one or two pairs of the lower leaves, depending on the length between the joints, and cutting clean across close to the lowest joint, and inserted in sandy soil in the frame or in pots or boxes. With amateurs and others requiring small supplies, they will be best in pots or boxes, unless a small hand-glass may be devoted to them. Give a slight watering after the cuttings are inserted, which will settle the soil about them; and the after-treatment consists in keeping the frame or glass close till they begin to callus, and shade when the sun is bright

up till then, after which they must be gradually inured to the full influence of light and air. Don't give water unless quite necessary—let them flag rather than drench them; they are safer rather dry than wet throughout the winter, but protect by means of a mat or a little straw on the glass in severe weather. They should be turned out as early in spring as possible, taking care first to inure them to the weather in the frame by the removal of the lights.

P. azureus (*Azure-flowered P.*)—The plant grows about 2 or 2½ feet high. The leaves are narrow, lance-shaped, and glaucous. The flowers are produced in racemes of considerable length, and are bright pale-blue. Native of California. The flowers open in July, and continue for a couple of months. An excellent hardy species, but more or less of stock should be stored by cuttings, as above directed.

P. barbatus, syn. **Chelone barbata** (*Bearded P.*)—This fine plant is better known in gardens by the name *Chelone* than *Pentstemon*, but the latter is the correct name. It is not an uncommon plant in even small collections of hardy border-plants, being very hardy and easily kept—not, in fact, requiring the annual propagation above directed in a general way. The plant grows 3 or more feet high, the stems being sparsely furnished with lance-shaped, somewhat glaucous, leaves. The flowers are bright scarlet, in long graceful racemes, the lower lip being bearded with orange-coloured hairs. They begin to appear in early summer, and last till late autumn. There is a splendid variety of this named *Torreyi*, more robust and luxuriant and freer blooming than the older form of the species, and more worthy of a place in limited collections of choice ornamental plants. Native of Mexico.

P. Cobæa (*Cobæa-like P.*)—A peculiar and distinct species, growing to the height of about 3 feet. The whole plant is clothed with short glandular hairs. The leaves are long, lanceolate, the margins marked with small sharp teeth. The flowers are produced in whorls in the axils of the leaves on the upper part of the stems, thus producing a somewhat leafy spike of considerable length. They are variegated purple, red, yellow, and white, the corolla being short and somewhat barrel-shaped. Native of Texas, and somewhat difficult to keep, especially in cold wet soils and extremely dry ones. Cuttings, too, are apt to perish in cold frames from damp, and are best kept in pots, so as to be easily moved, if necessary, into a warmer or drier position. It flowers also late—too late, in cold late districts, to be of much use; on these accounts it is clearly not to be recommended to amateurs, nor for culture in the north.

P. Fendleri (*Fendler's P.*)—This is a recently-introduced plant of great merit, on account of its dwarf habit and early-flowering tendency. It grows from 1 foot to 18 inches high, quite erect, having the stems clothed with deeply glaucous leaves. The flowers are borne in one-sided racemes of graceful appearance, and are light purple. They begin to open in June. Native of the Rocky Mountains.

P. glaber (*Smooth P.*)—A very beautiful species, growing about the same height as the last, but the stems are somewhat decumbent at the base. The leaves are smooth and shining, and narrow egg-shaped. The flowers are deep blue, but variable in shade in different individuals, if the plants are seedlings. They open in June, and continue in long succession. Native of the Rocky Mountains.

P. Jeffreyanus (*Jeffrey's P.*)—This is a brilliant plant, but not suited for all localities, being very apt to perish in those that are cold and in wet heavy soils. It grows 2 or more feet high, with glaucous leaves and brilliant purplish-blue flowers in graceful racemes. They appear in June or July, and continue for a month or two. Native of California.

P. Murrayanus (*Murray's P.*)—A deeply glaucous species, rather difficult to keep, and consequently rare in gardens. It grows about 2½ feet high. The leaves are deeply glaucous, narrow egg-shaped, rather thinly clothing the stems. The flowers are in graceful racemes, narrow, tubular, and shining, brilliant scarlet, appearing rather late in summer. In all parts of the country it will be necessary to give it a comfortable frame in winter, and a sunny warm position in summer.

P. pocerus (*Creeping P.*)—This is perhaps the dwarfest of all Pentstemons, being a prostrate creeping plant, forming carpet-like masses of dark-green oblong leaves, an inch or two high. The flowers are small, in small but graceful racemes, and very freely produced in June and July. The plant is perfectly hardy, and easily increased by division. Its dwarf habit renders it very useful for either the front line of mixed borders or for rockwork. Native of the Rocky Mountains.

P. Scouleri (*Scouler's P.*)—A very handsome but rather rare species. It grows about 2½ feet high, quite erect. The leaves are lance-shaped, smooth, the margins sharply toothed. The flowers are lilac or pale purple, in handsome racemes, appearing in early summer. Native of North America, and is a tolerably hardy sort, but flowers best from autumn cuttings, even if the plants may be trusted out in winter.

P. speciosus (*Showy P.*)—A very handsome and showy plant, growing 2½ or 3 feet high. The leaves are somewhat

glaucous, quite smooth, and widening a little towards the point. The flowers are bright blue, in whorled racemes, appearing in summer and lasting late. Native of North America, and rather variable from seed, both in stature and the colour of the flowers.

Phygелиus capensis (*Cape P.*)—The only species perhaps of the genus, certainly the only one in cultivation. It is a handsome plant, growing erect to the height of $1\frac{1}{2}$ foot to 2 feet, with square smooth stems. The leaves are dark green, shining somewhat, and egg-shaped, and toothed on the margin. The flowers are scarlet, drooping on their stalks, arranged in open terminal racemes, and appearing in summer and lasting till late autumn. A good well-drained loam suits it best, but it does very well in many different soils. Easily increased by division.

Scrophularia.—The only plant worthy of mention in this floriculturally uninteresting family is *S. nodosa variegata*, in which the leaves are finely blotched with white. It is striking and handsome, succeeds in any soil, and is propagated by division. The flowers are worthless, and the stems must be pinched out as soon as they appear.

Veronica (*Speedwell*).—A very numerous family, by far the largest number of the herbaceous species being weedy or uninteresting, and unfit for any ornamental use. Such as are worthy of cultivating are most accommodating plants, growing well in almost any kind of soil, and readily increased by division.

V. amethystina (*Amethyst-Blue Speedwell*).—The plant grows about 1 foot or 18 inches high, with numerous stems clothed with bright-green, lance-shaped, toothed leaves, on very short stalks, in whorls of three or four together. The racemes are terminal, and the flowers are produced in lengthened succession from July, being, as implied by the name, fine amethyst blue. One of the handsomest and most useful of the genus for border decoration, and adapted also for introducing into sunny banks and about the skirtings of shrubberies; but wherever the attempt is made to naturalise it, it should be borne in mind that it would be easily mastered by rank native vegetation, and that this must therefore be kept in check. Native of the south of Europe.

V. candida (*White-leaved Speedwell*).—A very dwarf plant, rarely exceeding in height 2 or 3 inches. It has creeping, somewhat woody stems, not herbaceous and annually dying away like the last, extending into neat carpet-like tufts. The leaves are oblong, oval, toothed, and clothed with dense, short, hoary pubescence. The flowers are in short spikes, blue, but neither ornamental nor lasting in a high degree. The foliage

is the only attractive feature about the little plant, which, along with its neat compact habit, renders it useful for edging purposes, for clothing rockwork, or introducing in borders wherever a patch of dwarf hoary foliage is wanted.

V. gentianoides (*Gentian-leaved Speedwell*).—This is a handsome but not a lasting species. The stems are simple, about 18 inches or 2 feet high, terminating in a compact raceme, of light-blue flowers, beautifully striated with darker blue and sometimes red. The leaves are mostly radical, oblong or ovate, bright green and shining, and slightly toothed. The flowers appear in early summer, lasting only a few weeks. Native of the Levant. There is a very good variegated form, perhaps altogether more ornamental than the green, from which the flower-stems should be cut as soon as they appear, in order to foster the production of leaves.

V. longifolia (*Long-leaved Speedwell*).—The normal condition of this species is only fit for naturalising in half-kept places. It is a tall, leggy plant, with weak downy stems, reaching the height of 3 feet or more in rich soil. The leaves are in whorls of three or four together, lance-shaped, and much attenuated at the point, and much and sharply toothed. The flowers blue, in close terminal spikes or racemes. This form is not worth growing but for the purpose already alluded to; but there is a neat and handsome variety named *incarnata*, with fine reddish pink flowers, which continue to open for two or three months, from July onwards. It grows about 18 inches or 2 feet high, branching freely at the top of the stems, and thus keeping up a long succession of its pretty flowers.

V. spicata (*Spiked Speedwell*).—This species grows about 1 foot or 18 inches high, with erect, stout, hard, and slightly-hairy stems. The leaves are oblong or lance-shaped, those below on stalks widening into the limb of the leaf, those above stalkless. The flowers are in dense spikes, the individual flowers small but deep blue, appearing in summer and lasting till late in autumn. This, along with the variety *incarnata* of the last species, are two of the best of the taller *Veronicas* for border decoration. Of this species there are varieties as regards the colour of the flowers, but it is in different shades of blue that the variation results mainly; there are, however, pretty white and pink varieties, but not so effective and lasting as the one described. There is also a form with variegated leaves and the blue flowers, but the variegation is not decided.

Wulfenia carinthiaca (*Carinthian W.*).—This is a lovely and interesting alpine plant, usually kept in pots in botanic gardens or such private collections as it may be found in. It is reputed

difficult to keep ; but such is not my experience of it, having grown it successfully in the front line of mixed borders in various aspects and soils. It is, however, best grown on rock-work, and delights in good rich loam, and peat or leaf mould well sharpened up with grit, in a partially-shady position, well drained, but not allowed to want for water in drought. The beauty of the plant claims for it a good position and some attention to its requirements. The plant forms handsome tufts of obovate, lance-shaped, bright-green, almost shining leaves, coarsely toothed on the margin, and wrinkled somewhat. The flowers are produced in one-sided spikes, about 6 or 9 inches high, and are beautiful purplish blue, appearing in July and August. Easily propagated by division. Should it be attempted in the mixed border, a few stones should be let into the ground ; but there must be no mounding or raising up, as is sometimes done with this plant : it dislikes elevation, unless at the same time it is shaded. Native of the mountains of Carinthia.

LABIATÆ.

A very extensive, and, like the last, a natural order, in which the family likeness is pervading and strong in all its members. By far the largest number of the genera are of herbaceous character, and very many are distinguished by more or less fragrant foliage, or fragrance in nearly every part. Many are splendidly beautiful in their flowers ; some are more remarkable in point of habit and foliage ; and altogether the order is rich in plants that may be turned to excellent account in ornamenting borders and beds, and in naturalising in many ways ; and although it contains a very considerable number of alpine or mountain plants, they are, as a whole, more easily cultivated than those of many other orders from the same regions.

Ajuga (*Bugle*).—This is a small family of dwarf plants, flowering mostly in spring and early summer, and all are blue-flowered, with the exception of one or two species unworthy of culture for ornament. They are all inhabitants of pastures, either mountain or lowland, and are easily cultivated in any position in tolerably good soil, and are easily increased by division.

A. genevensis (*Geneva Bugle*, syn. *A. pyramidalis*).—This is distinguished from the better-known *A. reptans*, or Common Bugle, by its sending out no creeping shoots. It forms rounded

tufts of dark-green elliptical leaves, smooth, but generally somewhat toothed. The flower-stems are erect, from 6 to 9 inches high; the flowers deep blue, being arranged in dense whorls along fully half the length of the stem, thus forming a close pyramidal spike. The plant varies in the length of the floral leaves or bracts: in the most showy form these are short, and the flowers consequently more conspicuous; but the most common form both in gardens and in nature has floral leaves, both broad and long, embracing and somewhat obscuring the flowers, yet a fairly ornamental plant, worthy of a place in the front lines of mixed borders or on the margin of shrubberies, and very well adapted for naturalising in rough rocky places, where it will establish itself in the fissures if the necessary soil and moisture can be secured; but being pasture plants, and loving moisture, the shady side of such places should be chosen, unless they are naturally moist. Native of Europe generally, the leafy spiked form a rare native of Britain.

A. reptans (*Creeping Bugle*, syn. *A. alpina*).—This in cultivation forms strong creeping masses of stems and foliage, similar in form to those of the last, and the flower-stems and flowers are deep blue, but the spikes are more cylindrical: they appear in early summer, or in May and June, and are very ornamental in the mass. There is a good white-flowered variety—an excellent companion to the blue; and there is a handsome variegated-leaved form, useful for edging and massing where hardy plants must be resorted to in bedding-out.

Cedronella.—A very handsome genus, chiefly or wholly natives of North America. They are only adapted for border ornamentation, flourish best in light rich sandy loam in warm situations, and are perhaps not quite hardy in cold districts north of the Tweed. They are, however, easily kept in the way recommended for Pentstemons, by cuttings taken in early autumn. They are choice border plants, and should have a place in every good collection.

C. cana (*Hoary C.*)—The plant grows 2 or 2½ feet high, erect and graceful. The lower leaves are egg-shaped, with a slightly-lobed and heart-shaped base; the upper ones heart-shaped, without the lateral lobes: all are hoary, as are the stems also, slightly. The flowers are lively red, in compact whorls, arranged closely on the upper half of the stems, and having the appearance of dense but graceful spikes. They appear in July and August.

C. mexicana (*Mexican*).—Distinct from the last in the absence of the hoary down on the leaves, and also in being taller and more luxuriant every way. The spikes are composed

of interrupted whorls of red flowers. They open in September and October, too late to be of much use in any district north of London. May be kept in the same way as the last.

Dracocephalum (*Dragon's-Head*).—This is a beautiful group of easily-cultivated plants. They succeed in any good garden-soil, and are increased by division, and adapted for either border or rockwork.

D. austriacum (*Austrian Dragon's-Head*).—A diffuse plant, with firm, slightly woody stems, about a foot high. The flowers are blue in terminal spikes. The leaves are stalkless, narrow, lance-shaped on the under part of the stem; those approaching the flowers and amongst them divided deeply into several narrow lobes. Flowers in June and July. Native of mountain pastures and stony places in southern Germany, the Pyrenees, and Tyrol.

D. grandiflorum (*Large-Flowered Dragon's-Head*).—A very distinct and handsome plant, growing from 6 inches to 1 foot high. The plant forms compact tufts of oblong, heart-shaped, slightly-toothed leaves, on short stalks. The flower-stems are erect or ascending, the leaves on them becoming wedge-shaped and coarsely toothed at the point, and stalkless. The flowers are large, produced in whorled spikes, and blue, appearing about July. Native of Siberia. More impatient of cold wet soil than any of the other species.

D. peregrinum (*Diffuse Dragon's-Head*).—Nearly allied to the Austrian D., but dwarfer and more diffuse. The leaves are lance-shaped, stalkless, and very slightly and distantly toothed. The flowers are borne in whorled spikes, each whorl being attended by a pair of spiny-toothed bracts. Flowers in July and August, and, like the last species, impatient of wet cold soil. Native of Siberia.

D. Ruyschianum (*Ruysch's Dragon's-Head*).—This is perhaps the most showy and useful of the group, being a profuse-flowering, hardy plant. It grows about 18 inches high. The leaves are narrow lance-shaped, as are also the bracts, and undivided. The flowers are in closely-whorled spikes, and fine purplish blue. Native of mountain pastures in the south of Europe. Flowers in July and August.

Horminum pyrenaicum (*Pyrenean H.*).—A pretty and interesting species, inhabiting moist pastures at high elevations on the Pyrenees and Tyrol. The leaves are mostly confined to radical tufts, are egg-shaped, toothed, on short stalks. The flowers are purplish blue, in open whorled spikes, on stems about 9 inches high, appearing in July and August. Best

adapted for moist rockwork in sandy loam. Propagate by division in spring.

Lavendula spica (*Lavender*).—There is no reason why a plant like this, though cultivated in gardens solely for use in domestic concerns, should not be turned to account as an ornament. It is undoubtedly an ornamental plant, but has become so much identified with the business of herb-growing and herb-cutting in our minds, that its beauty as an ornamental subject is lost sight of. But its glaucous foliage, its peculiar and attractive habit, and its no less attractive whorled spikes of flower, quietly assert their claim on our admiration, independently of the agreeable fragrance of the flowers. It is a beautiful plant, worthy of being rescued from the bye-corner into which it is generally thrust in most gardens. But it is no herbaceous plant : it is a little shrub, but so much akin to herbaceous plants, both in habit and association, that there is no risk of bad taste in associating it with herbaceous plants either in the border or on rockwork. It is perfectly hardy, but likes a warm, dry situation and soil the best. The propagation may be effected by seed or by cuttings, —the latter inserted in sandy soil in a cold frame in autumn ; the former may be sown in spring in a warm dry spot out of doors, in March or April. Native of the south of Europe. There is a white-flowered form, smelling as sweet, and flowering as well, as the blue, which will be considered worthy of a place for variety's sake, wherever the blue may be permitted, amongst ornamental plants.

Mentha (*Mint*).—Not any of the Mints, so far as I know, can be put forward as ornamental in flower ; but the variegated forms of *M. piperita*, *rotundifolia*, and *viridis*, are well worth growing in collections for the sake of foliage effects. They grow anywhere in any soil, and are easily propagated.

Melittis Melisphyllum (*Bastard Balm*).—This pretty and interesting plant is indigenous to Britain, being found wild in a few places in the south and south-western parts of England. The plant reaches the height of 1 foot or 18 inches, and is erect and dense in habit, with many simple stems. The flowers are borne in whorls in the axils of the leaves on the upper part of the stems, and present the appearance of a dense terminal spike. The calyx is the most prominent feature in the plant ; it is creamy white, thin, almost membranous, unusually large for a Labiate, and is much inflated or nearly bell-shaped. The corolla, about an inch in length, projects only a little beyond the calyx, falling over it with the broad lower lip, and is pink, purple, or variegated, white and pink, or white and purple, in the few varieties of this plant that have been observed. Not

any of the forms may be pronounced showy; they are simply chaste and pretty. It flowers in long duration throughout the earlier part of summer, and is for a long period trim, dressy, and pleasing. It is easy of cultivation, delights in partial shade, and is consequently well adapted for introducing into open woods and suchlike places, where it may be desirable to introduce characteristic plants. It is beautiful in the mixed herbaceous border or rockery, and is very accommodating as regards soil, any common moist garden-soil suiting admirably.

Monarda.—These are handsome border plants, with flowers of showy colour and characteristic appearance. They are easy to cultivate, succeeding in any moderately good garden loam, and increased by division. They may be introduced into open woods in strong patches in groups of the species, or associated with contrasting plants, and they are excellent for shrubbery decoration.

M. didyma (*Oswego Tea*).—The plant grows about 3 feet high, with erect stems, clothed with large egg-shaped leaves, attenuated at the points, and closely and sharply toothed. The flowers are in close head-like whorls at the extremity of the stem, and are deep-red, appearing in June or July, and lasting a couple of months. Native of North America.

M. Kalmiana (*Downy-flowered M.*)—This is a taller and stronger plant than the last. It grows about 3½ or 4 feet high, the leaves large, egg-shaped, sharply toothed, and somewhat downy on hairy stalks. The flowers are in very conspicuous head-like whorls, are deep crimson, and somewhat downy. Native of North America. Flowers about the same time, and lasting as long as those of the last.

M. purpurea (*Crimson M.*)—Near in habit and general appearance to the last, but distinguished from it at a glance by the large leafy appendages under the head of flowers, and the shorter flowers. It grows about 3 feet high; the leaves are egg-shaped, blunter-pointed than in the last species, not in the least downy, and coarsely toothed. Flowers deep purplish crimson, appearing and lasting about the same time as the others. Native of North America.

Nepeta (*Cat-Mint*).—A very numerous genus in names, but somewhat confounded as regards the species: for the most part there is good reason to believe that the larger number of the forms usually seen about botanic gardens as species, are capable of being referred to a few types. A few are good border plants, and easily accommodated as regards soil and situation. They may also be naturalised in open half-

wild places, or be used for ornamenting the margins of shrub-beries. Propagate by division.

N. Glechoma (*Ground Ivy*).—The common form of this very abundant but nevertheless pretty weed is not desirable in cultivated places; and it is so very generally to be found in neglected spots in nearly every locality in the country, that there is no reason to recommend it for naturalisation. But there is a handsome variety of it, with variegated leaves, not nearly so much grown as it deserves to be. The pretty orbicular leaves are blotched with yellow, and the prostrate or creeping growth is not so rampant as in the normal state of the species. It is one of the neatest of edging plants, and the most easy to manage, every joint forming a plant. Wherever the means or facilities for propagating large quantities of bedding plants are limited, this should be looked after for edging or carpeting. It is a good covering for roughish rocky banks or stumps, wherever it may have as much soil and moisture as will support it, and is a pretty edging to rustic baskets.

N. macrantha (*Large-flowered Cat-Mint*).—The plant grows about 2½ feet high, rather straggling, and branching much. The leaves are broadly and bluntly lance-shaped, toothed, and somewhat hoary, on stalks below, but becoming shorter, and ultimately stalkless above. The flowers are large, bright blue, in rather open whorled spikes. Native of southern Europe.

N. Mussini (*Mussin's Cat-Mint*).—A dwarfer and more diffuse plant than the last, better known in private gardens under the names *teucrifolia* and *longiflora*. It has bluntly-heart-shaped hoary leaves. The flowers are in long one-sided racemes, beautiful soft blue. They appear in late spring or early summer, and continue in profusion during summer and autumn. Height 1 foot or 18 inches. Native of Siberia. Although not one of the brightest of flowers, this is rarely surpassed amongst border perennial plants for the length and persistency of its display, and its attractive neatness throughout spring, summer, and autumn. It was freely used in bygone years in bedding out, and it is occasionally used in that way yet: for this purpose it must be propagated by cuttings annually in spring, requiring the same treatment as Verbenas and suchlike bedding stock. Treated thus, the plants are neater and uniform, and the bloom is even more sustained.

Phlomis.—These are striking herbaceous or suffruticose plants, with usually large downy and hoary leaves and conspicuous whorled heads of flowers. They are splendid subjects, all that are sufficiently hardy for the purpose, and only such will be here selected, for naturalising in open woods and rocky

places where they will have a good depth of soil in the fissures to grow in, and abundant moisture in the growing season. Both the shrubby and herbaceous species may be propagated by division, and are most accommodating as to soil and situation.

P. fruticosa (*Jerusalem Sage*).—This is a noble and striking plant in any position. It reaches the height of 3 or 4 feet, the stems stout and woody below, the branches downy. The leaves are large, egg-shaped, woolly on the under side, wrinkled and hairy above. The flowers are in large, dense, whorl-like heads at the extremities of the stems and branches, yellow, appearing in June, July, and August. Native of Sicily and Calabria. Very suitable for naturalising, and for associating with shrubs.

P. herba-venti.—This is an erect, handsome, herbaceous species, growing about $2\frac{1}{2}$ or 3 feet high. The stems are stout and much branched. The leaves are oblong, egg-shaped, boldly toothed, and hairy below, smooth and shining above. The flowers in the same style of inflorescence as the last are red, and appear in July, and last for a month or two. Native of southern Europe.

P. purpurea (*Purple-flowered P.*)—Another suffruticose species growing 2 or 3 feet high. The leaves are broadly egg-shaped, densely woolly on the under side. The flowers are purple, in the characteristic style of inflorescence, and appear in June, July, and August. Native of southern Europe.

P. Russelliana (*Russell's P.*)—This species is herbaceous, forming bold masses of strong stems about 3 feet high. The leaves are broadly egg-shaped, deeply heart-shaped at the base, wrinkled on the upper side, and hoary on both sides. The flowers are dusky purple, appearing in July and August. Native of the Levant.

P. tuberosa (*Tuberous-rooted P.*)—An herbaceous plant growing 3 or more feet high, with strong, erect, slightly-branched or simple stems. The leaves are broadly heart-shaped, slightly toothed, roughly wrinkled, and clothed with stiffish down below, and above with rough, short, thickly-set hairs. The flowers are reddish purple, appearing in July, lasting till late autumn. Native of Siberia and the south of Europe.

There are several other species, both herbaceous and shrubby, worthy of a place wherever naturalising may be engaged in, or where extensive shrubberies exist, and with the exception of *P. Lychnitis* and *Nissolii*, all are capable of existing in any part of the British Islands.

Physostegia.—A genus closely related to *Dracocephalum*, and comprising species which nearly all were formerly included in that family. They are handsome showy plants, adapted for

culture in mixed borders, or amongst shrubs where the rather lengthy stems of the taller species will be somewhat concealed. They succeed well in any good garden-soil, and are propagated by division.

P. imbricata (*Imbricate-flowered P.*)—This species grows about 3 feet high, in rich sandy loam, often taller: the stems are erect, clothed with opposite, broadly lance-shaped, sharply and rather coarsely-toothed leaves. The spikes of flower are long, appearing in the axils of the upper part of the stems. The flowers individually are smaller than in some of the other species, but are very closely imbricated in four rows, giving a quadrangular appearance to the spikes, and are pale purple. Native of Texas. Blooming in July, and throughout the remainder of summer and autumn.

P. speciosa, syn. **Dracocephalum speciosum** (*Showy P.*)—Scarcely so tall as the last species. The leaves are broad lance-shaped, closely and sharply toothed towards the point. The flowers are borne in handsome terminal and axillary open spikes, are large individually, and bright pink, appearing in July, August, and September. Native of Siberia.

P. virginiana (*Virginian P.*)—A very handsome plant, perhaps the best of the genus. It grows 2 or 3 feet high. The leaves are lanceolate, narrower than in the last two species, and are rather distantly and finely toothed. The flowers are produced in terminal and axillary spikes; are large, numerous, and purplish red. There is a handsome white-flowered variety, but rare. Native of North America; blooming in July and the remainder of summer and autumn.

Prunella grandiflora (*Large-flowered Self-heal*).—This is a lovely plant, forming masses of broadly oblong leaves slightly toothed. The stems are ascending or erect, about 6 inches or a foot high, the upper half of the length being occupied by the dense spikes of blue or purplish-blue flowers, which appear in July and August. Native of southern and central Europe, inhabiting dry hilly pastures. It flourishes in deep rich sandy loam, well drained, is a beautiful ornament of border or rock-work, and is propagated by division.

Salvia.—This is a very extensive genus, comprising many beautiful plants, some of the finest, however, being unfortunately too tender to endure in the open air our winters. In warm districts, in light sandy soil, *S. patens* is hardy, but in most districts it is not so, and must be lifted and stored under protection, and propagated by division or cuttings in heat in spring; or, what is a better mode, propagate by seed sown in February in heat, pricking off and potting on as the advancing growth of the

plants demands. All the tender suffruticose species, such as *S. splendens*, *gesneræflora*, *candelabra*, &c., have to be treated exactly like the general run of bedding plants; that is, if a sufficient stock of old plants cannot be stored for the purpose in view. But if that can be done the plant should be treated very much like Fuchsias at rest, and be further treated like them in spring, by being shaken out of their pots and repotted in the same sized pots, and encouraged to make growth rapidly: in fact, they may be grown along with the Fuchsias, and treated as to pinching and stopping as they are treated up till May, when they must be gradually hardened off preparatory to being turned out into beds and borders along with the bedding stuff in the end of the month. Plants so done make splendid objects in mixed borders, or in groups by themselves, associated with shrubs in sheltered places on lawns, or about flower-gardens. The hardy herbaceous species are plants of easy culture, succeeding well in rich sandy loam, and easily increased by division.

S. argentea (*Silvery-leaved S.*)—Hardy only in the southern and warmer and drier parts of the kingdom. It is worthy of cultivation for the leaves alone; indeed the flowers are neither highly ornamental nor lasting. The plant forms large tufts of large oblong leaves angularly lobed and cordate at the base, and densely clothed on both sides, especially the upper, with long silvery down. The flower-stems rise $2\frac{1}{2}$ or 3 feet high, having a few pairs of opposite leaves at the joints diminishing in size as they ascend. The stems branch freely into flowering branches. The flowers are in whorled spikes, and white, and appear in July. Native of Monte di Cammarata, Sicily, and Crete, in warm dry positions. A dry atmosphere is essential to it in winter—so dry as to necessitate its being sheltered in frames or greenhouses in the north. It is striking amongst collections of variegated or fine-foliaged plants in pots under glass.

S. bicolor (*Two-coloured S.*)—The plant is hardier than the last. The root-leaves are heart-shaped, usually with two spreading lobes at the base, and otherwise lobed and toothed, and woolly. The flower-stems rise to the height of 2 or $2\frac{1}{2}$ feet, with a few entire arrow-headed opposite leaves at the joints. The flowers are large, in rather distant whorls, white, with deep violet, and appearing in early summer.

S. bracteata (*Large-bracted S.*)—A distinct and handsome plant. It produces large deeply-cut leaves, hairy on both sides. The stems rise about 3 feet high, branching freely, and flowering freely. The flowers, individually, are small and purple, but are attended by conspicuous bracts. They appear in early summer, and last a few weeks. Native of Russia.

S. chionantha.—A very handsome species about 2 feet high, producing oblong, downy, hoary leaves. It blooms very profusely: the flowers are pure white, rather large, and appearing in early summer. Native of Asia Minor.

S. Forsköhlîi (*Forsköhl's S.*)—This species grows about 18 inches or 2 feet high, with almost naked stems. The leaves are mainly confined to the roots, are hairy, almost fiddle-shaped, with two rather prominent lobes at the base. The flowers are deep purple, appearing in June, and lasting most of the summer. Native of the Levant.

S. pratensis (*Meadow S.*)—A handsome plant, growing about 2 or 2½ feet high. The leaves are oblong, heart-shaped, hairy beneath, but very slightly so above; often lobed, but more generally irregularly toothed. The stems are sparsely furnished with leaves, and terminate in long, usually unbranched, racemes of whorled purple flowers, which appear in summer and autumn. A rare native of England, but rather common in hill pastures on the Continent.

S. verticillata (*Whorled S.*)—A tall species about 3 feet high. The leaves are egg-shaped, with a cordate base, often deeply lobed in the middle, irregularly toothed, and green. The flower-stems are thinly clothed with leaves. The flowers are in closely-packed whorls, twenty or more together; they are blue, arranged in long regular spikes, and appear in summer and autumn. A very free-flowering plant, easily distinguished from all other *Salvias* by the peculiarity of the style resting on the lower lip of the corolla, not protruding from the upper lip, as is the case with all other known *Salvias*. Native of central and southern Europe.

Scutellaria (*Skull-Cap*).—An interesting genus, of which very few species are worthy of culture for ornament. They are easily-managed plants, succeeding in light, well-drained, rich loam, and increased by division or cuttings, and seeds.

S. japonica (*Japan Skull-Cap*).—A pretty little creeping plant, with square stems and obovate leaves, diminishing into the short stalks. The flowers are in terminal spikes, freely produced, bright blue, and appearing in summer and autumn. Native of Japan. Best adapted for rockwork, but suitable also and succeeding well in the front lines of mixed borders if the soil is not too dry or clayey.

S. macrantha (*Large-flowered Skull-Cap*).—This is perhaps the handsomest species in cultivation. It grows 9 inches high, or thereabouts, with somewhat decumbent stems. The leaves are stalkless, bluntly lance-shaped. The flowers are produced in terminal spikes, are conspicuously large beside other *Skull-*

Caps, and are purple and white. They appear in summer and autumn. Native of Dahuria.

S. orientalis (*Eastern Skull-Cap*).—About 9 inches or 1 foot high: the leaves are shortly egg-shaped, and rather deeply toothed, and downy. The flowers are yellow, in quadrangular spikes, appearing in summer and autumn. Native of the Levant.

Stachys (*Hedge Nettle*).—A very considerable genus as to numbers, but there are very few of the species of an ornamental character. Those best worthy of cultivation for ornament are worthy chiefly on account of their foliage, and one species, for the sake of its densely woolly grey or white leaves, has been more or less used in bedding out. They are plants of the easiest culture, thriving in ordinary garden-soil, and increasing freely by division.

S. coccinea (*Scarlet Hedge-Nettle*).—A showy plant, worthy of a place in large collections on account of its flowers. The leaves are heart-shaped, hairy, and toothed. The flowers are produced in whorled spikes, and are brilliant scarlet. Flowers in summer and autumn. Native of South America. Height, 2 or 3 feet.

S. germanica, syn. **S. lanata** (*German Hedge-Nettle*).—This plant is best known in gardens under the latter name. Its woolly stems and leaves are very peculiar and striking, but the flowers are small and worthless for ornament. It is very well worth a place in mixed borders in any collection for the sake of the foliage effect. The plant forms low masses of oblong, lance-shaped, densely woolly, white leaves. The stems rise to the height of 18 inches or 2 feet, and are as densely clothed with the same white wool, having a few distant pairs of leaves at the joints; the flowers are in small woolly whorls, and are purple; appearing early in summer and lasting long. A rare native of England, and plentiful on the Continent, where it varies much in the form of the leaves, the density of the woolly covering, and the number of the flowers in whorls. It has been used, and is yet used to some extent in bedding-out for edgings, for which it is very fit.

Thymus (*Thyme*).—There are many forms of Thyme cultivated in gardens, and independently of their agreeable fragrance they are worthy of very general use, for being natives of dry, stony, or rocky places in nature, they are well adapted for naturalising in such places, and for clothing old walls and ruins. There is no great distinction of character between many of the so-called species. They are all, or nearly all, low-growing, more or less woody plants, and more or less strongly resembling

the Common Thyme, which is familiar to everybody. *T. lanuginosus*, a pretty and attractive little plant, with the habit and leaves of *T. Serpyllum*, the Wild Thyme, but densely clothed with woolly hair in nearly every part, is very desirable, and may be grown easily in any dry sunny position. The Lemon Thyme and the variegated garden Thyme are not uncommon, but desirable sorts; and of species less frequently seen in cultivation the following are also worthy of use for the purposes indicated:—*T. angustifolius*, *corsicus*, *Cephalotus*, and *azoricus*.

VERBENACEÆ.

Zapania nodiflora, *syns. Lippia nodiflora* and **Verbena nodiflora** (*Knot-flowered Z.*)—This pretty little plant is worthy of a place amongst alpine plants on rockwork, or in warm sunny borders, in light, rich, sandy, well-drained soil. It is scarcely hardy in the north. It increases freely by division of its creeping stems. The plant forms closely-creeping patches of stems. The leaves are wedge-shaped. The flowers are small individually, and arranged in small conical button-like heads, and are pale purple. Native of America.

ACANTHACEÆ.

Acanthus (*Bear's-Breech*).—These are fine-leaved plants, and as such worthy of a place in every collection of hardy plants. In warm sheltered places, in good, deep, well-drained soil, they may be naturalised in many parts of the country, but this will scarcely be advisable in cold northern localities. They like a deep good loam to grow in, and are propagated by division of the roots, and by seed.

A. mollis (*Soft Bear's-Breech*).—This plant is supposed to have furnished the idea of the acanthus leaf of Corinthian architecture. The plant produces large masses of soft wavy lobed leaves. The flower-stems rise 2 or 3 feet high, bearing numerous purple-and-white flowers in bracteated spikes. They appear in July, and last a couple of months. Native of the coasts of the Mediterranean.

A. spinosissimus (*White-spined Bear's-Breech*).—In this

species the leaves are much cut and lobed, and more rigid than the last, and the lobes each terminate in stout white spines. The flowers are in the same manner and colour as the last species. A native of warm parts of the south of Europe. The species *spinosus* and *longifolius* are intermediate in different degrees between the two described, and are from similar localities.

PRIMULACEÆ.

This is one of the best known and most cherished of those orders that contain hardy subjects. Some of the species, especially of *Primula*, are most familiar plants, and are mingled with the earliest and most sunny impressions of our childhood. The Cowslip and Primrose are amongst the earliest of spring flowers, and are welcomed by old and young everywhere; but perhaps to the young they are most welcome, after the dreary flowerless blank of winter. There are many alpine plants comprised in the order, which cannot be cultivated in the majority of localities without the advantage of rockwork, or the protection of frames in winter,—being either impatient of the winter humidity of our climate, or their flowers appear too early in our variable springs to be enjoyable. But there are also many beautiful plants, early flowering too, which are adapted to weather our worst spring blasts, or showers, or frosts, and which flower boldly and well under most discouraging circumstances. The culture of most of the genera, though in some points the same, will be best left for consideration under each subject as it comes up in the progress of selection; and all that it is necessary to add here is, that if the mode of propagation, when that operation is necessary, should be by seed, it should be sown at once when ripe. The seed of nearly all the *Primulaceæ* is slow to germinate, especially if kept in dry store for some months after it is ripe. The end in view will be attained, therefore, in shorter time if the seed is committed to the soil as soon as it is gathered.

Androsace.—This is one of the prettiest of the genera of *Primulaceæ*, and a most interesting group of alpine plants. Several of the species are annual, others are biennial, but the greater number are perennial, and all are rather difficult to keep under ordinary conditions near the sea-level. They are all strictly alpine plants, and are hardy enough to resist successfully the severest temperature we are liable to in this

climate ; but a moist stagnant atmosphere they cannot endure. Abundant moisture at the roots is delighted in by all the species, provided the drainage be good and the soil open and porous ; but the foliage of all the densely-hairy species at least should be kept dry in winter and protected from battering rains. The soil should be open fibrous peat and loam, in about equal parts, and should be well sharpened up with gritty sand ; and in the case of two or three species a little pounded limestone will be found advantageous, and is even delighted in by all. Some may be readily propagated by division, carefully done in early autumn or spring ; a few of the larger-growing species may be increased easily by cuttings inserted in very sandy peat and loam, in early autumn, in a cold frame in well-drained pots, in which they must be kept for the winter ; and all may be raised from seed sown in pots in a cold frame, taking care to exercise patience if they do not immediately appear. It is the most troublesome way of increasing stock of these pretty plants, but often the only way, especially when new sorts are being added to the collection ; if in that case the seed, as is most likely, is procured from the seedmen, it is well to defer sowing till spring.

A. carnea (*Rose-coloured A.*)—One of the earliest-flowering, though not the most handsome of the group. It forms lowly tufted masses 2 or 3 inches high. The stems and branches are clothed with narrow, awl-shaped leaves, crowded into thin, open rosettes near the points, and scattered thinly elsewhere ; and the stems and leaves are downy. The flowers are borne in pretty little umbels at the extremities of the stems and branches, and are rose or pink, with yellow tubes ; they appear in April and May or June. Native of the Vosges, the Alps, and Pyrenees.

A. Chamæ-jasme (*Bastard-Jasmin*).—This species, from the Alps, generally grows about 4 or 5 inches high, with weakly, trailing branches, bearing a few small lanceolate leaves at the extremities ; leaves and branches alike covered with long, spreading, silky hairs. The flowers are white, changing to pink, with yellow, often red, eyes, and are produced in small dense umbels about June, and continue till August.

A. ciliata (*Fringed A.*)—This is one of the prettiest of the family. It is a lowly plant, with weak, rather thinly-spreading stems, clothed with oblong, lance-shaped leaves, fringed with conspicuous grey hairs. The flowers are not, as in the last, borne in umbels, but singly on longish stalks ; and are purplish rose, with a darker centre. Flowers about June and July. Native of the Pyrenees.

A. helvetica (*Swiss A.*)—This species forms close cushion-like masses 1 or 2 inches high. The leaves are hairy, bluntly lance-shaped, and densely clothe the extremities of the short stems in small rosettes. The flowers are borne singly on the shortest of stalks, are pure white, and appear in July and August. Native of the Alps and Pyrenees.

A. lactea (*Milk-white A.*)—A pretty tufted species, growing 2 or 3 inches high. The leaves, in rosettes, are narrow, lance-shaped, smooth, and dark green, but fringed at the tips. The flowers are large, white, in umbels on erect stalks, appearing in June and July. Native of the Alps.

A. lanuginosa (*Woolly A.*)—A rather loose, trailing plant, usually more bulky in all its parts than the European species. The leaves are oval, lance-shaped, and densely clothed with silky white close-lying hairs. The flowers, in small loose umbels, are large individually, are bright pink with a yellow eye, and appear in June, July, and August. In warm dry soils this species succeeds well in the open border, but in summer requires abundant supplies of water; and when tried in this way there should always be a pot of cuttings struck in early autumn to provide against loss. Native of the Himalayas.

A. pubescens (*Downy A.*)—A closely-tufted species. The leaves are arranged in small rosettes, are linear, or widening somewhat upwards, and fringed with hairs. The flowers are borne singly, on short stalks, at the extremities of the shoots; and are pure white with a yellow centre. Flowers in June and July. Native of the Pyrenees and mountains of Dauphiny.

A. villosa (*Shaggy A.*)—A very pretty and distinct plant, and one of the smallest of the perennial species. It grows in close tufts, a few inches broad. The leaves are arranged in small rosettes, and are very narrow, oblong, and densely clothed with comparatively long, grey, silky hairs. The flowers, in small umbels, are pure white, with yellow or red centres. Found often in company with the last, and inhabiting the same countries generally. Flowers in June and July.

Aretia.—This genus is nearly allied to the last, and the species which most commonly represents it in cultivation often bears the generic name *Androsace* and *Gregoria*, but chiefly amongst botanists, for it is best known to gardeners by the name here adopted. It requires the same treatment in all respects as the *Androsaces*.

A. Vitaliana (*Vital's A.*)—A very pretty and distinct plant, prostrate in habit, with numerous stems clothed with linear acute leaves. The flowers are yellow and numerous; they

appear in May and June. It forms a very beautiful object on rockwork, and is not so difficult to manage as some of the Androsaces. Native of the Alps, Pyrenees, and the Abruzzi.

Cortusa (*Bear's-ear Sanicle*) embraces only one species, the *C. Matthioli*. It is near akin to *Primula*, and in general appearance and habit of growth resembles some of the species of that family. It is found, in company with several of the alpine *Primulas*, inhabiting moist valleys at high elevations on the Alps of Italy and neighbouring countries, and is therefore best adapted for cultivating on rockwork, where partial shade and abundant moisture can be given it in the growing season. In warm sheltered situations, where moisture abounds in the atmosphere and the soil is naturally or artificially well drained, it may succeed in the open ground ; but there are very few places in this country where these conditions exist in the degree necessary to the wellbeing of this little plant. It will therefore be safer to keep it on rockwork, of which it is more characteristic than the open dressed border, and in cold wet localities less or more of it should be kept in pots and wintered in a cold dry frame to provide against loss of stock. Rich loam, or a little peat and loam, with a liberal allowance of sharp sand, forms a congenial compost. Whether in pots or otherwise, it must be remembered that ample drainage should be provided, and copious supplies of water during the time it is making growth. Propagate by seeds and division, the latter immediately after flowering or in early autumn. It is rather a handsome little plant, with nothing very showy either in the mass or colour of the flowers, but will always be interesting to those who take a delight in the simple beauty of alpine plants. The leaves are nearly round, heart-shaped at the base, very slightly lobed, and sharply toothed. The flower-stems are about 6 or 8 inches high, terminating in a small loose umbel of few small bright red flowers on drooping foot-stalks ; the corolla is slightly bell-shaped, and deeply divided in five segments. Flowers in April, May, and June.

Cyclamen (*Sowbread*).—There is perhaps no more attractive group in the whole range of alpine plants than that comprised in this genus. They are all neat and dwarf in habit ; all have foliage of pretty form ; and the flowers, in every case beautiful, are in some exquisitely so. They are mostly spring-blooming plants—so early, indeed, that in our fitful climate their beauties are rarely enjoyed out of doors ; but cultivated in pots they are well adapted for the decoration of rooms, the conservatory, or greenhouse ; and for choice cut flowers, the fine colours, peculiar and beautiful form, and, in the case of some sorts, the deli-

cate fragrance they possess, render them charming. Their culture is simple enough when their nature and requirements are understood and attended to. With the exception of *C. persicum* and its hybrids and varieties, and perhaps also *C. repandum*, the remaining species may be considered hardy alpine plants. For the most part, the species inhabit high cold regions on the great mountains of southern Europe, and their constitution is consequently adapted to resist the greatest cold they will be exposed to in our climate; but when winter is gone, and we are looking forward with expectation for the unfolding of their beauties, along with the lengthening days of March and April, the late frosts and battering rains so common in these months bring disaster to Cyclamen flowers, as they do to the flowers of many more important things. Something may be done to protect them, with hoods or extinguishers of *frigi domo*, so made as to be easily slipped over and fastened upon stakes permanently fixed around the plants, in anticipation of inclement weather; but it is troublesome and unsatisfactory, inasmuch as we are often taken at unawares by the sudden changes experienced in the spring months. It is necessary, therefore, if we would fully enjoy the beauty of the early-flowering Cyclamens, to provide them with indoor accommodation of some sort. It is one of the recommendations of these plants that they do not take up much room in winter; many may be stored in small space. A cold frame in which the pots may be plunged in coal-ashes is the most suitable place for them; but in the absence of that, they may be stored under the stage of a cool greenhouse, or in a vinery or peach-house, in which, if not provided with heating apparatus, the roots would require to be protected by some means in severe weather. Hand-glasses and cloches are fit enough also for wintering a few plants, and they may even be successfully flowered in such; but nothing could be better for the cultivation of these and kindred plants all the year round than those cheap ground vineries; they are specially commendable to amateurs for such purposes.

The only successful means of propagating these plants is by seeds. Division of the root-stock has been recommended, and may be practised, but the result is bad; solid corms, like those of Cyclamen, when divided, never produce vigorous healthy plants. The seeds, if early ripened, may, in the southern parts of the country, be sown at once thinly in shallow pans, and placed on a spent hotbed, cold frame, or on the shelf of a greenhouse near the glass, attending properly to watering, and, after the plants appear, to shading from direct sunlight. In the north, however, where the season is short and the ripening of

the seeds later, it is better to defer sowing till February or March. About that time a mild hotbed should be in readiness to receive them, in which the temperature should range not higher than 60° , nor lower than 50° , but be kept pretty steadily between the two. The compost in which to sow is of some importance, as the plants will remain in it undisturbed for the next seven or eight months; and as a vigorous infancy lays the foundation for a successful maturity, a little pains at this first stage will prevent after-disappointment. Equal parts fibrous loam and peat, and about a fourth part of two or three year old sheep or cow dung, with a very liberal allowance of sharp sand, form a compost in which *Cyclamens* delight. The whole must be carefully mixed, and for the seed-pans should be passed through a $\frac{3}{4}$ -inch sieve once or twice, and a small portion for the purpose of covering should be sifted finer; but for established plants, the compost need not be sifted, but merely rubbed, and mixed carefully with the hands. Sow, as before said, thinly in shallow well-drained pans; cover lightly, but completely, and place in the hotbed. Till the plants appear the atmosphere of the frame is best kept moderately close, and shading should be used to prevent sudden drying of the surface of the soil by the sun; but when the plants are fairly visible more air will be necessary in order to induce vigorous growth: sudden fluctuations of temperature must, however, be guarded against by all means till the weather becomes less variable and the plants acquire greater strength. From first to last, during the growing period, shade from bright direct sunshine is of the utmost importance to the wellbeing of *Cyclamens*, whether seedling or established; and careful attention to this item, in the treatment of seedlings especially, cannot be too strongly inculcated. Up till the end of August everything should be done to stimulate rapid and vigorous growth. Admit morning and afternoon sun, and, according to the condition of the external temperature, a free allowance of air early in the day, but shut up with a little extra warmth in the afternoon, reopening the lights again a little at night throughout the three summer months; and attend carefully to watering and cleanliness. By the last week in August, the plants under this treatment will have made considerable progress, and attention must now be directed to the maturing of growth before finally setting them to rest. Cautiously inure them to a fuller exposure to light and air, till the lights may be wholly dispensed with; and be more sparing in the supply of water, but never allow the leaves to flag. The first week in October should find them well matured, and they may then be turned out of the seed-pans, saving the fibres from

unnecessary injury in the process, and potted singly into pots suited to the size of the corms, bearing in mind that the first shift should be a small one, and that the pots be well drained. When potted, plunge to the rims of the pots in coal-ashes, and give water sufficient to settle the soil about the roots, after which for the winter they will require little attention except that of giving air when the weather is mild, protection from severe frost, and a vigilant look-out for slugs, which are fond of nibbling the young tender corms. About February or March they will begin to move of their own accord, and if frame-accommodation may not be afforded them, they should be hardened off preparatory to standing out of doors in April or May, and plunged in a bed of coal-ashes in a well-sheltered, partially-shaded situation. One or two shifts may be necessary throughout the summer as the plants increase in size, but the shifts should be small. In October, if the pots are well filled with roots, the plants may receive a final shift and be stored away for the winter in the best manner the available means will allow, and in the following spring they should yield a reward for all this care and trouble in a plentiful crop of flowers.

The treatment for established plants does not consist of many details. Encourage vigorous growth for a couple of months after flowering is finished, remembering always that shade from mid-day sun is essential during this process ; water abundantly, and keep clean, and in the end of September or beginning of October, before putting them away for winter, give a shift if required, but in any case examine the drainage, and repair it if necessary, and throughout the winter see that the roots do not shrivel for want of water. By these means, if carefully applied, ample success is certain. But those whose circumstances do not admit of such expensive and troublesome details should not be discouraged from the cultivation of Cyclamens. A few roots of flowering size of the hardy sorts may be procured and planted in September, in light rich soil, well drained, either on rock-work or in a warm sheltered border ; and when spring comes round, protect the flowers from the inclement weather by the best means at disposal. The autumn-flowering species may be enjoyed with less trouble than those of spring, and do very well planted in the same way, but the cream of the gems is in the spring-flowering sorts. It has to be added that, in planting or potting, the corms of those species, such as *C. persicum*, which are naturally large, should be inserted to such a depth as will bring their tops about level with the surface of the soil, and those naturally small should be slightly covered over with the soil. Nearly all the spring-flowering sorts will bear a little

forcing, and by this means a welcome succession of flower may be kept up throughout the dreary winter months. The *C. persicum* sorts are best for this purpose. They bear extra excitement with less injury than most of the hardier species do.

C. Coum (*Round-leaved C.*) is a diminutive species, but also one of the earliest flowering, and consequently very desirable, though not one of the handsomest. The corms are smaller and smoother than those of the same age of most other species. The leaves are small, round, heart-shaped at the base, and entire on the margin. The corolla is small, bright red or purplish red, and divided into five ovate reflexed lobes. Flowers from February to April. Native of the mountains of the south of Europe at high elevations. *C. C. album* is a very pretty variety of this species, and, flowering as it does at the same time, is an excellent companion to it. *C. C. carneum* is another interesting variety, with blush-coloured flowers.

C. europæum (*Common C.*)—This is a large-growing species with roundish, heart-shaped, toothed leaves, often zoned on the upper surface with pale green. The flowers vary in colour in different individuals, but in nature the most common colour is white or rose, or both shading into each other, but purple and various shades of red are also met with, and in cultivation there are varieties distinguished by different combinations of these colours. Flowers in August and September. Britain and other parts of Europe.

C. hederæfolium (*Ivy-leaved C.*) is perhaps, from the scientific point of view, not distinct from the last species, but the form usually vended under the name has distinctly angular leaves with a cordate base, and the flowers are lilac shading into rose. Flowers in August and September. South of Europe, usually in company with *C. Europæum*.

C. ibericum (*Iberian C.*)—A very beautiful and distinct species. Leaves roundish, heart-shaped, sometimes toothed, often entire, and zoned irregularly with a band of greyish green. The flowers are large, variable in colour in shades of rose and white, but always marked at the base of the lobes, which are sharply lance-shaped, with a dark crimson or purplish crimson blotch. Flowers in March and April. Iberia.

C. neapolitanum (*Neapolitan C.*) is rather a variable species, and sometimes confounded with the first two. The leaves are most variable; but most commonly they are of the ivy shape, with a cordate base, and distinctly zoned on the upper surface. The flowers are dark red, shading into pink or pale purplish red at the tips of the lobes of the corolla. Native of Italy.

C. persicum (*Persian C.*), though the tenderest, is one of the best. The corms are large. Leaves large, rather variable in form, but generally broadly ovate, with a deeply cordate base and slightly toothed margin, and more or less zoned irregularly with pale greyish green. Flowers large, dark red or crimson at the base of the lobes, which are white or pinkish white. Flowers in March and April. Cyprus. *C. Coum* hybridised with the pollen of *C. persicum* by Mr Atkins of Painswick, produced the famous cross named *C. Atkinsii*, which for profusion of bloom, fine colouring, and amplitude of beautiful leaves, surpasses all Cyclamens. It has the neat compact habit of *C. Coum*, with greater luxuriance, and the large flowers of *C. persicum*. It is, however, more correctly a race than a fixed hybrid form that has resulted from this cross, and many of the varieties are beautiful in the extreme, though not very distinct one from another. Other varieties of *C. persicum* are *C. persicum rubrum* and *C. persicum roseum*, both desirable companions to the species.

C. repandum (*Repand C.*), sometimes called *ficariaefolium*, is one of the best of the smaller-growing species. The corm is small. Leaves roundish, cordate, obscurely lobed, and minutely toothed. Lobes of corolla broadly ovate, bright red at the base, shading off into rose. Flowers in April and May. Greece. Rather a tender species, and very impatient of wet in winter.

C. vernum (*Spring C.*) has small corms. Leaves small, round, cordate at the base, and slightly notched at the point, the upper surface zoned with a band of pale green within the margin. The flowers are deep crimson, and appear in March and April. Native of the south of Europe at high elevations.

Dodecatheon (*American Cowslip*) is a small group of pretty, well-known, and much-admired hardy border plants. They are of simple accommodating nature, doing well in most soils and situations, but reach the greatest perfection in deep moist rich loam and in partial shade. Propagate by division in early spring, or by seeds, which they produce freely.

D. integrifolium (*Entire-leaved D.*) has oblong leaves destitute of teeth. The flower-stems are from 6 to 12 inches high. The inflorescence is the same as in *D. Meadia*, but the divisions of the corolla are more acute, and the colour is rosy crimson. Flowers April, May, and June. Native of North America.

D. Jeffreyi (*Jeffrey's D.*)—A very distinct species, in which the great leaves are the most distinguishing feature; but on closer examination it will be found to differ from the other known forms in the more important characters of the parts of

the flowers, which are divided into fours instead of fives. The stamens, petals, and sepals are each four or divided into four, whereas in the other forms they are five or divided into five. Native of the Rocky Mountains. Flowers early summer.

D. Meadia (*Common D.*) is the best-known species. The leaves are all radical, stalkless, oblong lanceolate, thin and soft in texture, and pale green, obscurely toothed, dying off shortly after flowering. The flower-stems are 1 foot or more high, bearing a considerable umbel of elegant drooping flowers of interesting shape. The flowers are rosy purple, and divided into five broad much-reflexed segments. Flowers in April, May, and June, and in the north often blooming well through July. There are several varieties of this species of greater or less distinctness, which are often vended as species. The best of them are, *D. M. elegans*, syn. *giganteum*, remarkable for greater luxuriance in all its parts, and rather more delicate colouring; *D. M. album*, with white flowers suffused with rose; and *D. M. lilacinum*, with rosy-lilac flowers.

Hottonia.—So far as is at present known, this pretty and interesting genus of aquatic plants comprises only two species—the one a native of North America, and unknown to cultivators in this country; the other inhabits ponds and sluggish streams in England and Ireland and other parts of central and northern Europe. *H. palustris* (Water Violet) is the European species. It is valuable for introducing into ponds and streams where aquatic vegetation is desirable, being interesting and ornamental for a long period during summer. The leaves and barren branches are all submerged; the former are deeply cut into fine thread-like segments, giving a feathery appearance to the submerged growth, and suggesting strikingly the other common name (Featherfoil) by which it is known in some parts of the country. The flower-stems are leafless, and rise erect above the water, bearing several whorls of rather large flowers, deeply divided into five broad lobes. The flowers are variously coloured in different individuals—pale purple is the most common colour, but blue and white and pink are also to be met with, and they appear in June, July, and August, and often also in September. It is easily propagated by division, and also by seeds. If the latter method is adopted—and it is the simplest, if they have to be transported a distance—they should be sown immediately they are ripe in the quarters they are to occupy permanently, the only care requisite being the prevention of the washing of the bottom by floods if the pond or stream in which they are sown be liable to such disturbance, and the destruction that would be caused by waterfowls, till

such time as the plants are strong enough to take care of themselves, which they will be the year after sowing.

Lysimachia (*Loose-strife*).—This is a useful, showy, and free-flowering group of plants. There is some diversity of habit among them, but very little of colour, yellow predominating in the majority of the species. They are best adapted for culture in moist soils and situations, and are well fitted for naturalising in moist woods and by the sides of lakes or ponds and streams, and all are easily increased by division in autumn or spring. They succeed in any kind of soil if moist.

L. angustifolia (*Narrow-leaved L.*), from North America, is a very graceful species, growing to the height of 1 foot or 18 inches, with terminal leafy panicles of nodding pale yellow flowers. It is useful for the same purposes as the two last species, and is well worth a place in the mixed border. Like the others, it delights in moisture, and is not fastidious as to the quality of the soil. The flowers appear in June and July, and throughout the greater part of summer, in moist ground.

L. ephemerum (*Willow-leaved*), from several parts of the south of Europe, is very distinct from either of the foregoing species. It grows about 2 feet high, with rather graceful habit, and the stems and branches terminate in handsome racemes of white flowers. The corolla is rotate, with deeply-divided spreading lobes obovate in form. It flowers in July and August, and is most suitable for cultivating in the mixed border or the margins of shrubberies in good moist soil.

L. Nummularia (*Moneywort L.*) is one of the prettiest and most interesting. It is a dwarf prostrate plant, throwing many branches out in all directions from the centre, which in moist situations root at the joints and so spread many feet. The flowers are yellow and appear in June, and last on till September and October if occasionally pinched in to induce fresh growth, and kept moist. It is useful for a variety of purposes—for clothing rockwork, moist banks, front lines in mixed beds and borders, and for festooning the margins of rustic vases where such ornaments may with propriety of taste be introduced into flower-gardens. Native of Britain and Europe generally. A variety with yellow leaves or yellow variegated leaves, recently introduced, is of considerable value, and will, when more generally known, become a favourite in the flower-garden of any style.

L. thyrsiflora (*Tufted L.*), native of Britain and other parts of Europe, of Northern Asia, and America. It is 18 inches high, dwarf, with simple or unbranched erect stems. The flowers are

yellow, in rather dense racemes, and appear in June, July, and August. Useful for the same purposes as the preceding.

L. vulgaris (*Common L.*), like the last-named species, is a native of Britain, and Europe generally, appearing also in many parts of Asia and in Australia. It rises erect to the height of 2 or 3 feet, with branching stems terminating in loose leafy panicles of yellow flowers, which appear in July, August, and September. It is not at all a choice-looking plant, but it is valuable for introducing into moist open woods, and for planting on the banks of ponds and streams where the natural vegetation stands in need of improvement, and for lighting up masses of shrubs. It succeeds in any common soil, but delights most in partially-shaded moist places.

Primula.—This is a very beautiful and interesting group of hardy border and rock plants, which in bygone years was much admired and extensively cultivated in this country, but latterly it has been entirely neglected, at least in the gardens of the rich. It is rather astonishing that it should be so, Primulas are so fragrant, so beautiful in colouring, and so neat in habit; and the majority of the species, flowering as they do in spring and early summer, present a character so desirable, that one would think lovers of flowers, whether professional or amateur, could not easily forget or forego them. There are signs, however, of the old love being taken up again. Some beautiful varieties of the Cowslip and Primrose are found very useful in the spring flower-garden, for which they are very fit; and the catalogues of florists and seedsmen are swelling with new species and varieties in addition to many old and well-known sorts. The majority of Primulas are very accommodating in cultivation, adapting themselves to many kinds of soils and situations, but are most at home in sandy loams, deep and moist, but well drained and in moderately shady positions. They are easily propagated by seeds,—remembering always that it often requires the exercise of patience and following directions already laid down,—cuttings, and division, the last being the simplest and easiest process where large increase is not an object. In laying in first stock, seed is the best and cheapest way in the case of the varieties of the Auricula, Primrose, and Polyanthus, unless fine named sorts are wanted, when they must of course be purchased in plants, and by name, the same as with other florists' flowers; and the finer and more rare species must be got in the same way, because seeds of those are not always procurable true in this country. For a couple of months or more after germinating, the plants do not require much room, and are liable to be destroyed by slugs and other pests whilst

in the tender seedling state. A cold frame, hand-lights, or glasses, should therefore, if possible, be devoted to them, in which they will be more easily guarded against all enemies than if they were in the open ground. Small pots should be used to sow in, and they should be plunged in sand or coal-ashes. The soil should be sandy loam, peat, and well-decayed leaf-mould, in equal proportions, with plenty of sharp sand to keep the whole sweet and open. Sow thinly, and keep the soil regularly moist till the plants appear, when caution in watering will require to be exercised to prevent damping, to which Primulas are all rather liable in their first stages from seed. As soon as the plants are big enough to handle, they must be pricked out thinly in pans, pots, or boxes, and returned to the frame, or set in a shady, warm, sheltered place, and well attended to with water,—taking care, however, not to allow the soil to become stagnant with too frequent waterings, which would very soon be followed by sickness and death to the plants. Primulas delight in moisture in the growing season; but a good sound watering at intervals, not daily driblets or sprinklings, is what they want. When the plants have made sufficient roots and bulk of leaves they may be transferred to their permanent quarters, and well watered after planting, when they will need little more attention for the season beyond keeping them clean. In the case of getting up large quantities of Primroses and Polyanthes, for the purpose of planting out in woods and suchlike places, the foregoing directions would be troublesome and expensive, as they are only meant for the more valuable and rare species and varieties. The common varieties are best sown on a warm border in the beginning of April, in beds, broadcast or in drills, and, when fit to handle, planted out in nursing-lines in rich soil well manured with old hotbed dung. Cuttings are best put in in spring, when growth has fairly begun: the same soil as recommended for seeds is suitable for cuttings. Division should be done immediately after flowering is over, unless large increase of particular sorts should be desired, or when the plant is very weak and would obviously be invigorated by being divided immediately before flowering commences; in such cases everything should be done to prolong the growing period, and all flowers removed as soon as they can be got hold of. Under the name *P. veris*, Linnæus included the three forms of Primula most common in this country,—the Primrose, *P. vulgaris*; the Oxlip, *P. elatior*; and the Cowslip, *P. veris* of modern botanists, being considered by him essentially the same for the purposes of science. But to gardeners and florists it is convenient to distinguish between the

three forms, which are well marked and pretty constant in cultivation. The common flower-stalk in the Cowslip rises considerably above the leaves, supporting an umbel of flowers; and in the single varieties, the corolla is small and cup-shaped—features that are lost sight of in the double varieties, or florists' Polyanthuses. From this form there are many varieties, some of which are most beautiful things in their season, and worthy a place among choice plants. The commoner single sorts are suitable for planting in woods and on banks, and about the edges of masses of shrubs.

P. amœna (*Beautiful P.*) is perhaps the finest of the *cortusoides* section. The leaves are of the same form as those of *P. cortusoides*, but narrower and less acutely toothed; the flower-stalks are stouter, and rise to the height of 9 inches or 1 foot; the umbels are larger, as are also the individual flowers, which are bright lilac, with a clear pale eye. A moist but well-drained position on rockwork is the most suitable for it, and peat and loam, with plenty of gritty sand, the most congenial compost. Flowers in March, April, and May. Native of the Caucasus.

P. Auricula is the parent of the well-known varieties of stage and border Auriculas. In its native habitats on the German, Swiss, and Italian Alps, it is rather a variable plant, but not to such an extent as to shadow forth, even remotely, the endless and beautiful combinations that have sprung from it in the florists' hands. Yellow and red are the most common colours in nature, with purple occasionally; and Sells are more common than variegated varieties, which is also true of the majority of florists' varieties raised, only the variegated forms are the most favoured. It would take more space than can be allowed here to notice in detail the method of cultivating and raising the finer varieties, which have been most favoured by florists; and it is the less necessary to do so, because treatises on the subject have been long in existence, and give details ample and curious enough to satisfy the most particular inquirer. Almost any of the varieties are worthy of cultivating, were it for no other purpose than that of yielding early crops of cut flowers out of doors. Where these are wanted in quantity, the fragrance and pretty colours of the Auricula render them very desirable. All that are suitable for this purpose may be grown in the borders of the kitchen-garden, about the margin of shrubberies, &c.; and they will succeed in any common garden-soil, if not too heavy and wet.

P. cortusoides (*Cortusa-leaved P.*) is a very pretty species from Siberia. It forms compact tufts of bright-green, heart-shaped, bluntly-toothed leaves; the flower-stalks, slender and

erect, are slightly shaggy with long soft hairs; the umbels are compact and rather large, and the flowers deep rose. It is a very showy species, and best adapted for the rockwork; rarely very satisfactory in the open border, except in the most favourable situations—not but that it is perfectly hardy as regards capability of resisting cold, only it requires a freer drainage at all times than generally can be secured at the ordinary ground-level. In summer, however, it will take astonishing supplies of water, while making growth, if the drainage is good. Sandy rich loam suits it best. Flowers throughout May, June, and July.

P. denticulata (*Small-toothed P.*) is a species of considerable interest and beauty. It is rather vigorous in habit, with large, oblong, lanceolate, toothed leaves, hairy on both sides, but densely so beneath, especially on the veins. The stoutish flower-stalks rise to the height of 9 inches or 1 foot in luxuriant individuals, and terminate in compact umbels of many small bright lilac flowers. It is a very hardy and accommodating species; for though usually classed among Alpines, it succeeds very well in the open border in most places where light rich loam and a dry bottom exist; but it is undoubtedly most at home on well-drained rockwork, where it can be liberally supplied with water during the growing season. Good rich loam, a little peat, and abundance of gritty sand, form the most fitting compost for it on rockwork, or in pots if it should be cultivated in them, as it occasionally is, for the decoration of the greenhouse and conservatory in spring. It bears a little forcing, and may be had in bloom a month or six weeks earlier than the natural flowering period by being placed in gentle heat in January and February. The flowers appear in April, May, and June. Native of the Himalaya.

P. denticulata, var. **nana**.—Under this name Messrs Backhouse of York recently introduced from the Himalaya a sort of *Primula* that must be considered a decided improvement on the older *P. denticulata*, if it is not indeed entitled to be regarded as a distinct species. The leaves are similar in form and texture to those of *P. denticulata*, the flower-stalks are stouter, and the dense umbels of bluish-purple flowers are nearly twice as broad, and the flowers are conspicuously marked with a yellow eye. It is a vigorous, hardy plant, and forms a striking object on rockwork or in pots. The same soil and treatment as for *P. denticulata*.

In **P. elatior** (*Oxlip*) the common flower-stalk is generally shorter and stouter than that of the Cowslip, but is variable in length and strength; always, however, showing the umbel above the foliage, and the corolla is broader and flatter than

that of the Cowslip. This is the least constant form of the three, and its varieties are less numerous and interesting than those of the other two; they are mainly useful for planting along with the commoner sorts of Cowslip and Primrose in woods and suchlike places.

P. erosa, syn. **Fortunei** (*Himalayan P.*)—This is a near relative of *P. denticulata*, but quite distinct. It is about equal in stature, but the flower-stalks, which are rather stouter, are invariably mealy, except in starved individuals suffering from drought and continuous exposure to the sun. The flowers, which are somewhat larger than those of *P. denticulata*, are purplish lilac, with a conspicuous yellow eye. It is a charming rock-plant, requiring the same soil and treatment as the others in this section. Flowers in March and April.

P. farinosa (*Bird's-eye P.*) is a species of altogether another type from any of the foregoing, but not less attractive and beautiful. It is compact, dwarf, and somewhat tufted in habit. The leaves are small, covered all over—on the under side densely—with mealy down of musky odour; the flower-stems rise 5 or 6 inches above the leaves, bearing many-flowered umbels of deep rose-lilac or purple yellow-eyed flowers. It is a beautiful rock-plant, and should be provided with a well-drained but moist and moderately shady spot; in the growing season it can hardly be kept too moist. The compost most congenial to it is mostly peat, a little loam, and abundance of sharp sand. Flowers in May, June, and July. Native of Britain and other parts of Europe.

P. farinosa, var. **acaulis**, is a remarkable and interesting variety, being almost destitute of flower-stem, and forming the small umbels of flower scarcely in relief of the mealy white foliage.

P. intermedia (*Intermediate P.*)—This excellent Primula is reputed a hybrid between *P. minima* and *P. ciliata*. It is of vigorous growth, and resembles some of the varieties of *P. auricula* in its smooth pale-green foliage, which is destitute of farina. The flower-stems are stout and erect, about 9 inches high, and support umbels of bright purplish-crimson flowers. Adapted for either the rockwork or mixed border in rich light sandy loam, well-drained but moist. Flowers in April and May.

P. involucrata (*Involucrated P.*) is nearly related to Munro's *P.*, but generally considered inferior to it. It is not so vigorous. Leaves in shape and texture similar, but not cordate at the base; flower-stems weaker, and the umbel fewer-flowered. Flowers white in April and May. Native of Northern India.

Succeeds well on rockwork, in warm districts, in gritty peat and loam : to be kept moist in summer and dry in winter.

P. longiflora (*Long-flowered P.*) is closely related to *P. farinosa*, but is more showy. The style of growth and mealy foliage are similar, but the little umbels are less compact, and the flower-tubes, as implied in the specific name, are very long ; it is, in fact, more interesting and pretty than showy, as all of this class are. The soil and treatment recommended for *P. farinosa* are what this species requires also. Flowers bright red in May, June, and July. Native of the Alps.

P. marginata (*Mealy-margined P.*)—A very dwarf species, forming rosettes of oblong bluntly-toothed leaves, the margins being conspicuously covered with white dust. The flowers are borne on stout stalks in considerable umbels, and are pale purple or lilac, appearing in April and May. Native of the Alps and Pyrenees. A very handsome species, and hardier than many of the Alpine species, succeeding well in the mixed border or on rockwork in deep, rich, well-drained loam.

P. minima (*Smallest P.*)—This is quite a little gem, very diminutive, with small, wedge-shaped, smooth leaves, rather boldly notched or toothed at the tops. The flower-stems are short, bearing usually only one bright rose-coloured, white-eyed flower, an inch or more in diameter. It is best adapted for rockwork, and should have the same soil and treatment as recommended for *P. farinosa*. Native of the mountains of Switzerland and the Pyrenees. Flowers in April and May.

P. Munroi (*Munro's P.*) is a very distinct and beautiful species. It is pretty robust in growth. The leaves are longish ovate, slightly cordate at the base. Flower-stem stout and erect, about 9 inches high, with a compact umbel of large white flowers. Very handsome on rockwork in gritty peat and loam ; kept moist in summer and dry in winter. Flowers in May and June. Native of Northern India.

P. Palinuri (*Palinure's P.*) is another very beautiful yellow-flowered species. It grows to the height of about 9 inches or 1 foot, with smooth serrated spatulate leaves and a stoutish flower-stem bearing a lax umbel of large yellow nodding flowers. Succeeds in light rich loam, moist, but well drained, either on the open border or on rockwork. Native of the south of Europe. Flowers in April and May. Not capable of enduring winter out of doors in cold localities.

P. scotica (*Scotch P.*)—Confined, in Britain at least, to one or two localities in the north of Scotland, with broader leaves, shorter and stouter flower-stems, and broader and shorter lobes to the corolla, which is purple, with a yellow eye, but in all

other respects resembling *P. farinosa*: is by botanists considered as only a well-marked variety of that species.

P. sikkimensis (*Sikkim P.*)—This is one of the best of the yellow-flowered species, and is very distinct from the last named. The leaves are oblong, rather blunt at the points, unequally toothed. The flower-stems rise to the height of 1 foot or more, bearing rather loose umbels of large pendent flowers of a pale-yellow or sulphur colour. Succeeds best on rockwork well drained, in soil the same as recommended for *P. Stuartii*. It is, however, very impatient of damp in winter, though equally fond of it in summer, and in cold wet localities it would be advisable to keep a plant or two in pots in a dry cold frame to prevent loss of stock. Flowers in May and June. Native of the Himalaya.

P. Stuartii (*Stuart's P.*)—This is perhaps the finest of the yellow-flowered Primulas. It is a vigorous species, with long lanceolate acute leaves, sharply serrated, and covered below with pale sulphur-coloured meal. Flower-stems also mealy, rather stout, about 1 foot high, bearing an involucrate umbel composed of many large yellow flowers; involucre composed of many smallish leaves. The rockwork is most congenial to this species; it delights in abundant moisture in the growing period, but in winter it is very impatient of wet. Flowers in June and July. Native of Nepal.

P. verticillata (*Whorled P.*)—This is a beautiful and elegant species, with the peculiarity, as implied in the specific name, of bearing the flowers in whorls. The leaves are oblong, almost lanceolate, sharply serrated, and mealy underneath—tube of the corolla long, and the colour yellow. It is a very desirable species, but requires the protection of a dry cold frame during winter in this climate. Flowers in March and April. Native of Egypt. Same soil and treatment in summer as the foregoing.

P. villosa, syn. **P. ciliata** (*Villous-leaved P.*)—A dwarf handsome plant. The leaves are obovate, the margins toothed on the upper half, and fringed with glandular hairs all round. Flowers purple, borne in considerable heads, and appearing in April and May. Native of the Southern Alps and Pyrenees. Best fitted for rockwork adornment.

P. vulgaris (*Primrose*).—The Primrose is distinguished from the Cowslip by the flower-stalks having the appearance of springing directly from the root, and bearing each only one flower: there is, however, a common foot-stalk so short as to be concealed by the leaves. The corolla in the Primrose is larger than that of the Cowslip, and flat. There are many

very interesting and beautiful varieties of Primrose, both single and double; the single varieties need not be enumerated, but are very useful for planting out in clumps or patches, as recommended for the commoner forms of Cowslip. The best of the double varieties are the flesh-coloured, the white, the sulphur, the lilac, the red, the coppery, and the dark purple: the three last are rare, and difficult to procure. All are invaluable for the spring flower-garden, for rockwork, and for many other purposes in the kitchen and fruit gardens.

Soldanella comprises a most interesting group of the smallest and most beautiful of alpine plants. It is nearly related to *Cor-tusa* and *Primula*, but is easily distinguished from either by the cup-shaped deeply-fringed corolla, and by the style of the foliage, which, with the simplest variation, is the same in all the species, and at the same time very distinct from that of any of the species of the related genera. They are found at very lofty elevations on the Alps of Europe; two, at least, of the species ascend to near the line of perpetual snow. To be successful with them, we must, as near as circumstances will permit, imitate the climate and other conditions of their native homes. I have seen them succeed very fairly in an open peat border in Ireland, but they are soon lost if any attempt is made to cultivate them in the open border in the majority of localities—and, indeed, success is not always sure on rockwork; but with proper care and attention they are very manageable in pots, wintered in frames, and bloomed there, and transferred to the rockwork to make growth. A moderately shady position is best, and they would suffer a constant state of saturation, and be the better for it while growing, provided the drainage is good; but when ample growth is made, less moisture is necessary. In nature they are deluged with snow-drip while growing, but it must be remembered that on the steep mountain-sides and rocky places on which they are found it is impossible that stagnation can take place. In winter they will endure much cold, but suffer disastrously from damp; the frame, therefore, in which they are wintered should be cool and dry; and if they are left on the rockwork out of doors, a ledge projecting overhead, so as to protect from battering showers, would be a good safeguard. Propagate by division immediately after flowering, and by seeds sown as soon as ripe in a cold frame.

S. alpina (*Alpine S.*) has small round leaves, dark green, smooth, and somewhat leathery, on short stout stalks. The flower-stalks are erect, bearing two or three bright purple, slightly bell-shaped, deeply-fringed flowers. Flowers in April

or May. Sandy peat and loam. Very high elevations on the Alps, Pyrenees, and Apennines.

S. montana (*Mountain S.*) is closely allied to *S. alpina*; the leaves are similar in form but larger, and the flowers are more numerous in the umbel, less deeply fringed, and paler purple. Flowers in April and May. Found in moist open woods at high elevations on the mountains of Austria and Bohemia. Very sandy peat and loam, the peat predominating.

S. minima (*Smallest S.*) is perhaps the prettiest, as it is also one of the least, of the group. The leaves are very small, and nearly round or kidney-shaped. The flower-stalks are erect but slender, bearing usually only one comparatively large flower, whitish, and veined on the inner surface with pale purple, the fringe not deep. Flowers in April and May. Mountains of Switzerland, Styria, and Carniola. Same soil as for the two preceding species. There is a pretty white-flowered variety, but very rare.

S. pusilla (*Feeble S.*) is very beautiful, but rather rare. It is in the way of *S. minima*; the flowers, however, are bright blue, and I have met with an almost copper-coloured variety that is interesting. From the Alps of Switzerland. Flowers in April and May. Sandy peat and loam, the peat predominating.

Trientalis europæa.—This pretty little plant is a native of Britain and other countries of Europe, also of North America and Asia, always affecting the colder latitudes, or, if appearing in the warmer countries, it rises into the mountains. Old fir or other open moist woods are its favourite haunts. It is a solitary species, and the sole representative in the flora of Britain of the seventh class in the Linnæan system of botany; but it is not a good seventh, the parts of the flowers being often found in fives. The whole plant rarely exceeds 6 inches high, with erect wiry stems bearing a few leaves whorl-fashion at the top, and from the centre of these spring the chaste and graceful star-like white or pale-pink flowers with a small yellow eye. On rockwork it must be placed in such a position as that shade and moisture will be secured to it, and the soil it most delights in is open gritty leaf-mould, or very sandy peat and light loam. It does not succeed cultivated in the ordinary exposed mixed border or bed, shade being very essential to its wellbeing; but it is a most useful plant to introduce into moderately shady moist woods or banks, with a northern aspect, where the natural herbage is not too rank and overpowering. In all cases where the introduction of it is contemplated, the soil above named should be liberally allowed;

it well repays a little trouble in the first preparation for its reception. The flowers appear in cultivation usually in May or June, but in nature often a month later. Division is the best method of propagation.

GLOBULARIACEÆ.

Globularia.—These are charming little alpine plants, distinguished, as the name implies, by the inflorescence being gathered together into compact globular heads. Some of the species are not hardy in all parts of the country, and the following should be avoided in making selections for cultivation in the open air north of London, unless the climate of the locality is mild in winter and the soil light and warm:—*G. Alypum*, *integrifolia*, *longifolia*, and *spinosa*. These may succeed well in the southern parts of England and in many parts of Ireland, but, except in the more favoured parts of the west of Scotland, they are likely to succumb to the bad effects of our winter climate in the north. The majority of the hardy species are best adapted for the rockwork in most parts of the country, and most of them succeed well in the open border in light rich naturally well-drained soil, where a little shade can be given them. They are pretty things in pots, and in wet cold localities they will not live for any length of time, unless kept in pots for handiness for winter protection. Rich peat and loam form the best compost for them in pots, and it should be well sharpened up with rough gritty sand. They are easily increased by division, which is best done in spring as growth commences, and attention to watering will be necessary for some time afterwards till the plants are fairly established.

G. cordifolia (*Wedge-leaved G.*) is of somewhat creeping habit, rooting at the joints as it extends. The root-leaves are wedge-shaped on longish stalks, blunt and toothed at the points. The flower-stems are about 6 or 8 inches high, clothed at the base with leaves, similar in form to, but smaller than, those of the roots. The flowers are blue, and appear in June and July; suitable for the mixed border as well as for the rockwork, but a somewhat shady situation should be chosen for it. Native of Germany.

G. nudicaulis (*Naked-stalked G.*)—This is rather a stronger-growing species than the last named. The root-leaves are lanceolate, on short foot-stalks, and the flower-stems are nearly

naked, having only a small lanceolate bract or two under the flower-heads. The flower-heads are large, dark blue, and appear in June and July. Native of Germany, and adapted alike well to the rockwork or mixed border, in partial shade.

G. nana (*Small G.*) is a very diminutive species, forming dwarf carpet-like patches of small, bright-green leaves. The flower-heads rise only an inch or two above the foliage, are not large, but profuse, are pale blue or lilac, and appear in June and July. Native of the mountains of France, and suitable only for cultivation on rockwork, or in pots in gritty peat and loam.

G. vulgaris (*Common G.*) grows about 6 or 8 inches high. The lower leaves are stalked and lanceolate, the upper ones stalkless and smaller, but of the same form. The flower-heads are dense and bright blue, appearing in May, June, and July. Common on the mountains of Europe generally. Adapted for cultivation on rockwork or in the open border where a little shade can be secured.

PLUMBAGINACEÆ.

There are some useful and beautiful hardy herbaceous subjects in this family, but they are not numerous, and they are chiefly characterised by neatness and grace of habit rather than gay colouring. They will be found useful for a variety of purposes in the flower-garden, the majority being most useful as border and rockwork ornaments.

Armeria (*Thrift*).—These are all neat low-growing plants, yielding a great profusion of flowers for a lengthened period in summer, and generally they are very pleasing and attractive plants. They are easily cultivated, doing best in light sandy loam, and propagate freely by division in spring or early autumn, by cuttings in some cases, and by seed.

A. alpina (*Alpine Thrift*).—A dwarf species, with tufted linear leaves in close masses, not very distinct in most respects from *vulgaris*. The flower-stems are about 6 inches high, bearing a round compact head of reddish or pale-purple flowers, which appear in early summer and last a month or two. Native of alpine pastures in most of the mountainous countries of Europe. Like the common Thrift, it may be used for edgings to alleys and walks.

A. cephalotes (*Crimson Thrift*).—Perhaps the most beautiful of the group. It forms dense tufts of lanceolate leaves,

dark green and smooth. The flower-stems are a foot or more high, surmounted by a compact spherical head of rosy-crimson flowers. It flowers very freely from May or June throughout the summer. Native of the Mediterranean.

A. plantaginea (*Plantain-leaved Thrift*).—This is near in character to *Cephalotes*. It has the broad leaves and taller flower-scapes of that sort, but is not so decidedly effective in colour, and is usually more restricted in growth. The flowers are deep rose-red, in compact heads. Native of the south of Europe. There is an important white-flowered variety named *leucantha*, which is accounted a fairly distinct species for a Thrift in some works. It is very ornamental, and furnishes an excellent variation of colour in this, in that respect, rather deficient group—the flowers being beautiful clear white.

A. vulgaris (*Common Thrift*).—A well-known plant, to be met with in nearly every cottage garden in the country. There are several varieties—the best is the rose or red one, and there is a tolerably good white and a pale lilac—all are useful pretty plants. Besides the very common use of edging to which it is put, it may also be employed in bare rocky ground and dry banks, for clothing such places, as it has considerable tenacity of life once it is established, and does not easily succumb to the influence of drought.

Acantholimon glumaceum, syn. **Statice ararati**.—This is a beautiful little plant, growing in prostrate fashion, with numerous matted stems, clothed with linear, hard, dark-green bristle or spine-pointed leaves. The flowers are rose-coloured, in numerous short one-sided spikes. They begin to appear in April, and continue in great profusion for a month or two. It is best adapted for culture on rockwork, and prefers a light sandy soil and sunny position. In well-drained light soil it succeeds very well in the open border; it is quite hardy, but liable to suffer from continued damp in winter, therefore it is not well adapted for cold wet localities and soils; and in such, extra precautions, by draining well under the plant and planting it on raised hillocks, if it is grown in borders, must be taken. It is one of those plants that are worthy of a place in every garden, and is especially commendable for amateur and other small gardens. Propagate by seed, cuttings, and division, and the latter is the least troublesome means once stock is established, but the divisions should not be too minute. Native of Armenia.

Statice (*Sea Lavender*).—This is a large genus, but in the hardy section there is a good deal of sameness in the colour of the flowers, blue being the most common. There is, however,

a considerable variation in foliage and stature, but a few of the more distinct forms are all that are needed, in our selection, to secure the best of those that are in cultivation. They all succeed best in deep sandy loam, and should not often be disturbed. Propagate by division in spring, which, in the majority of species, requires to be carefully done, and by seed in small pots in a cold frame; or in slight heat, if available, in March.

S. eximia (*Pink Sea Lavender*).—The plant grows a foot or more high. The flower-stems are leafless. The leaves are tufted about the roots, and are oblong, widening somewhat towards the point. The flowers are produced in freely-branching panicles, are very numerous, but small and pink, appearing in June or July, and lasting a month or two. Native of Sougaria.

S. globulariæfolia (*Globularia-leaved Sea Lavender*).—A neat-growing species, with a tuft of small obovate leaves terminating in an abrupt sharp point. The flower-stems are leafless, 6 to 9 inches high, and branching into rather close panicles of small blue flowers, appearing early in summer, and lasting a month or two. Native of the Mediterranean. Best adapted for rockwork in sunny positions, unless the borders are well drained and composed of rich light sandy loam.

S. Limonium (*Broad-leaved Sea Lavender*).—Perhaps the finest of the hardy Staticeæ for border decoration. It produces a bold tuft of oblong dark-green leaves, widening toward the point. The flower-stems are leafless, branching much; the branches extending wide at the base, and shortening as they ascend to the top, forming a corymbose panicle; the flowers are blue, and appear in August and September. The species is somewhat variable, and one of the best forms of it that has appeared in gardens is that named *latifolia*, which is not only more luxuriant as regards the foliage, but in the inflorescence also, which becomes considerably more ample than that of the type. Native of the coasts of western Europe, Asia, the Mediterranean, and America, and is not uncommon on the coasts of England. Height 18 inches.

S. tatarica, syn. **Goniolimon tataricum** (*Tartarian Sea Lavender*).—The plant grows a foot high. The leaves are all confined to the roots; they are oblong-lanceolate, widening somewhat upwards, are dark green, and terminate in an abrupt sharp point. The stems branch very freely, forming handsome open panicles; and the flowers are pink, appearing in August and September. Native of Tartary.

Valloradia plumbaginoides, syn. **Plumbago Larpentæ**.—A beautiful border-plant, but barely hardy in all parts of the

country, being often cut up in spring by late frost, and again in autumn by early frost in the pride of its bloom, especially in late cold localities. It enjoys a warm sunny aspect and light, rich, well-drained loam, and is worthy of a good position, being a gay and choice plant. It is a diffuse plant, producing numerous flexible stems, hard, wiry, and somewhat angular. The leaves are numerous and rather thickly placed alternately along the stems and branches, and are obovate or oval, tapering most at the base, but stalkless. The flowers are in terminal clusters, fine bright blue at first, but changing afterwards to deep violet; they appear in August, September, and October. Height 9 to 12 inches. Native of China.

POLYGONACEÆ.

Polygonum (*Knotweed*).—This is a very generally weedy group, numerous in species. One or two species only are worthy of a place in collections of hardy ornamental perennials, on account of their pretty flowers and neat habit. The three species selected below do well in any kind of well-drained soil, the two last being more susceptible of injury from damp, or damp and cold combined, than the first. They are propagated by division.

P. Bistorta (*Snakeweed*).—This plant is found in wild places in many parts of Britain, preferring chiefly moist places, as about the margins of streams; and it is more useful for introducing into such places than for the herbaceous border, unless the collection is an extensive one. It is not averse to shade, and may be usefully introduced into moist woods. Propagate by division. The stems are simple, erect, terminating in a longish cylindrical spike of pink flowers very densely packed. The leaves at the roots and base of the stem are large broadly lance-shaped; those on the stems are similar in shape, but smaller, and often heart-shaped and almost stalkless. Flowers in early summer, lasting often late in moist places. Height about 18 inches or 2 feet.

P. Brunonis.—This plant is creeping in habit, with numerous close-lying stems, clothed with lance-shaped toothed evergreen leaves, tapering sharply at both ends, on longish stalks. The flowers are deep rose in dense but irregular spikes, supported on stems about 9 inches high; they appear rather late in summer, and continue late. Native of the Himalayas.

P. vacciniifolium (*Whortleberry-leaved Knotweed*).—Like the last, this is a creeping evergreen plant, but with neater habit and leaves, and even prettier and more profuse flowers. The leaves are acutely oval, dark green, entire, and shining. The flowers are pink or rose, in regular graceful spikes, appearing about July and lasting till late autumn. The plant suffers often in spring from late frosts, the leaves becoming embrowned, but otherwise it is hardy. It should have a sunny warm position, and might escape the scathe of late frost in sheltered warm rockwork.

ORCHIDACEÆ.

This, perhaps the most interesting and splendid of all natural orders of flowering-plants, comprises some singular and beautiful hardy species. Very few of them are known outside botanic gardens, and they are reputed to be difficult to cultivate. Some are undoubtedly difficult to keep, requiring peculiar conditions as regards soil and other circumstances. These will not be introduced here. But there are others so easy to manage under very ordinary circumstances and by ordinary experience, and so beautiful and interesting, that they cannot be omitted. If I had the option, I should prefer cultivating all these Orchids in pots well drained on a cool bed of ashes in the best aspect—that is, the sunniest that could be chosen, and in a frame so as to have it entirely in my power to control light and otherwise to adapt atmospheric conditions to the requirements of the various subjects. But it is often Hobson's choice in this as in many other things with cultivators, and they must make the best they can of their circumstances. There is, however, an absorbing interest in the structure of these plants which, independently of their beauty, will induce those whose love of plants is genuine to take up their culture, even under difficulties which enthusiasm will make light of. They may be cultivated in pots, then, in the way indicated above. Some, as will be shown afterwards, may be grown in the mixed border; all may be grown on well-constructed rockwork; and for the majority, a good gritty fibrous loam will be found generally congenial. Special requirements will be noticed afterwards where necessary. One very general condition to their wellbeing is that of covering the surface of soil, be it in pot, border, or rockwork, with some-

thing to prevent excessive evaporation, from which they all suffer more or less during the growing period. In nature they are all found growing amongst and mixing with other low-growing plants like themselves. They are natives of hilly pastures, moist or dry, woods, thickets, and bogs. The herbage of such places cannot be imitated closely in cultivation, but we have many little plants quite adapted for the purpose of surfacing in such cases. The tiny *Ionopsidium acaule*, the *Spergula*, and smaller *Arenarias* are all fit for this purpose; and a pinch of the seed of any of these may be cast over the soil thinly, and will need no further attention. Other surfacings, such as Sphagnum and other mosses, and cocoa-fibre, may be adopted; but the living protection will be found the best, and always sweet and wholesome.

Cypripedium (*Lady's Slipper*).—There are several handsome and interesting species of this group in cultivation. The peculiar slipper-like form which the lip assumes is a very obvious and striking feature, and they are altogether, as regards structure and colouring, amongst the most beautiful of hardy Orchids. In cultivation they are best grown in some free, open, porous soil, such as fibry loam and peat; but good turfy loam, well sharpened with sand, will do alone if good peat cannot be had. The drainage should be good; no stagnation should be permitted. They will not succeed well in open exposed borders, being fond of an hour or two's shade in the middle of the day. They require good supplies of water in the growing season, but when the foliage begins to go off they should get less, and be kept pretty dry throughout the winter. Propagated by division in autumn or spring; if the latter, let it be early.

C. acaule (*Short-stemmed L.*)—The whole plant does not exceed 6 inches high. It produces only two leaves, which spring directly from the root. The flower-scape rises between the leaves, terminating in a single flower, which is rose-and-white, or pure deep rose-colour. The lip, or slipper, is split up the middle, which, independently of other peculiarities, distinguishes this species from every other hardy one in cultivation. Native of North America.

C. Calceolus (*Common L.*)—This species is a very rare if not nearly extinct native of Britain. It is a large-growing plant, with leafy stems reaching the height of 18 inches. The leaves are large below, diminishing as they ascend the stem both in length and width, the larger ones being egg-shaped and sharply pointed. The flowers appear usually solitary at the extremity of the stem, and are distinguished by the clear

yellow or purple and yellow lip and long brownish-purple sepals and petals ; they appear about June.

C. pubescens (*Downy L.*)—This is nearly related to the last. It grows about the same height; the leaves are similar in form, and are clothed with soft short hairs. The flowers are composed of a yellow lip and long, pendulous, twisted, yellow sepals and petals. Native of North America. The flowers open in June.

C. spectabile (*Noble L.*)—This is the finest of the species in cultivation, and perhaps of the genus. It grows about 2 feet high; the stems clothed with broadly egg-shaped leaves covered with longish soft hairs. The flowers are composed of a large inflated lip, rose-coloured, and the sepals and petals, shorter than those of some of the other species, are pure white, and in individuals the lip is also pure white. This species is more partial to shade and moisture than any of the foregoing, and a little peat is beneficial also; indeed, it will often luxuriate better in sandy moist peat alone than in loam alone.

Goodyera pubescens (*Downy G.*)—There are several hardy species of this genus, but this is perhaps the best, and is also one of the most easy to cultivate. It is a creeping plant, with egg-shaped leaves, beautifully marked on the green ground-work with silvery-white veins. The flowers in spikes are creamy-white, and appear in June or July. The leaves are the most ornamental part of the plant. The plant is not adapted for culture in the open air the year round, for, though perfectly hardy, and a moisture-loving subject, it must be kept drier in winter than it is possible under ordinary circumstances out of doors. It is, therefore, better grown in pots, or, along with others requiring similar treatment, planted out permanently in a well-drained frame, in sandy turfy peat and loam, with chopped Sphagnum freely mixed therewith. Easily propagated by division in autumn or spring. Native of North America.

Orchis.—This is a large genus, in which there are one or two species which may be established in mixed borders and on rockwork. They should only be attempted in cool, moist, partially-shaded borders, in good loam, all the better if it is chalky. The only way to procure sound and vigorous stock to start with is to resort to their haunts in nature, and this may be easily done in the case of the British species at least. They are best lifted when in flower, and should be taken up with balls attached to the roots, and with care. Plant them in patches as large as desirable, for they will not increase much in many years, and leave them undisturbed so long as they are

doing well : and when otherwise, there is no help for it but turn them out and get a fresh supply from the same source.

O. latifolia (*Broad-leaved O.*)—This species grows about 1 foot high. The leaves are egg-shaped or broadly lance-shaped, sometimes spotted, more usually not. The flowers are purple, slightly variegated with a lighter shade of the same colour, in long dense spikes. A native of moist pastures in Britain, the Continent of Europe, and northern Asia. Flowers in May and June.

O. laxiflora (*Loose-spiked O.*)—A rather luxuriant and handsome species, growing 1 foot or 18 inches high. The leaves are narrow, lance-shaped, occasionally spotted. The flowers are rich purplish-red, in long loose spikes, opening in May and June. Native of the Isles of Jersey and Guernsey and many countries of the adjoining Continent.

O. maculata (*Spotted O.*)—A very beautiful plant, growing about 1 foot high. The leaves are usually lance-shaped and spotted. The flowers are pink or purple, but varying in the depth of colour, with the lip usually marbled with a deeper shade ; they are produced in handsome spikes about May and June.

O. militaris (*Military O.*)—A very beautiful plant, growing 1 or 2 feet high. The leaves below are long, broadly oval, or broadly lance-shaped. The flowers are in dense spikes, are purple, appearing in May or June. A rather local native of Britain, but abundant on the Continent in upland pastures. *O. fusca* of the catalogues is a marked variety of this plant with darker purple flowers.

Ophrys.—This is a singular and beautiful group, equal in beauty if not so showy as the last. Their culture in the open border is hardly practicable, I fear, but they may be established in pots and on rockwork with facility ; and the same means and method must be resorted to as have been already described under *Orchis* for procuring stock. They are more impatient of wet in winter than the species of the last group, and should be well drained if left out on the rockwork, and the same also in pots, for though we find them luxuriating often in moist pastures in nature, they will not submit to the same in cultivation. They are not so particular about shade as the *Orchis*, but are the better for having the surface of the soil clothed with some dwarf carpeting of herbage.

O. apifera (*Bee O.*)—The plant grows from 9 inches to 1 foot or more high. The leaves are lance-shaped, rather broad, and bluntish. The curious and beautiful flowers are produced in loose spikes at the top of the stems, and consist of the egg-

shaped petals and sepals, which are usually white, tinged with pink, and the broad convex lip, which is rich velvety-brown and reticulated with paler brown or yellow lines. The whole flower is suggestive of a bee on wing. Native of hilly dry pastures in chalky or limestone districts in Britain—but rather local—and southern Europe. Flowers in early summer.

O. aranifera, syn. **O. fucifera** (*Spider O.*)—This grows about the same height as the last, but is not so pretty, though not less interesting. The flowers, like those of the Bee O., are produced in few-flowered loose spikes at the extremities of the stems, and are similarly constructed; but the sepals and petals are green, and the lip duller brown, with lighter-coloured spots in the centre. Flowers in early summer. A rare native of Britain, in similar soil and situation as the last, and southern Europe.

IRIDEÆ.

This is a splendid and numerous family, embracing, amongst the more distinguished members, the Iris itself, Gladiolus, and Crocus. Several small but extremely showy genera, such as *Anomatheca*, *Tigridia*, and *Ixia*, are often of short duration in flower, and are otherwise unfit either for the decoration of the hardy border or rockwork, being either not hardy, except in a few favoured localities, or so difficult to keep up in health without having resort to very exceptional means, that they must be classed as frame rather than border bulbs, taking the length and breadth of the country into account. These, therefore, will be passed over without further mention.

Crocus.—A very familiar genus of spring and autumn flowering-plants, adapted for planting in mixed borders, about open woodland walks, on banks; in fact, anywhere and everywhere that colour may be desirable in spring the early-flowering kinds may be planted. Their culture is a very simple matter. They succeed in nearly every kind of soil—best, however, in that which is light and well drained and tolerably rich; and they furnish ample and unfailing means of propagation in the natural annual increase of the bulbs. They require to be lifted periodically—say every three or four years at furthest—after the leaves decay, and replanted either immediately or at convenience before October, the ground being well dug, and, if poor, enriched with well-decayed dung or leaf-mould beforehand. They may be planted 2 or 3 inches deep, and 1 inch or more apart, according to

the size and strength of the bulbs. For the ordinary purposes of decoration above alluded to, the common varieties in white, purple, and yellow, and in various shades and combinations of these, are the best, being cheap and easily procurable from seedsmen and bulb-dealers in quantity, either in separate colours or in mixture. No further enumeration of these is thought necessary here, but a few of the forms usually regarded as species in gardens are described below; but it may be remarked that the characters on which the species are founded are inconstant or variable, or of a trivial nature, and that there is a good deal of confusion, and many bad species created on very slight characters, appreciable only to those who have paid years of attention to them in cultivation. It is worthy of being mentioned that Crocuses generally are very variable, as are also nearly all the genera of this order, from seed; and those whose inclination lies that way, may increase their varieties to almost any extent by saving and sowing the seed from the ordinary varieties in cultivation. The seed may be sown as soon as ripe, as it is apt to lose vitality quickly if dry-stored for any length of time. Sow in the open ground on an east or west border behind a wall or hedge, making the earth moderately rich with well-decayed manure or leaf-mould, and pulverise it well. They will not be fit to handle till the second autumn after sowing, but it will be well to lift them then and replant them, either in new ground or in the same place after it has been well dug and manured in the moderate degree already alluded to. They will flower very sparingly, perhaps, the third spring from sowing, but very generally the fourth spring. It is a fact worth knowing, because curious in itself, and appreciable by any one, that the seed-vessel in *Crocus* is at first nearly stalkless, and close to the bulb underground; but after flowering the stalk elongates, and ultimately supports the seed-vessel at a greater or less height above ground.

C. biflorus (*Scotch C.*)—This is a white-flowered sort, the flowers being striped externally with purple, and the throat or tube internally is yellow, and destitute of hairs. The leaves are long, very narrow, and sharply-pointed. The flowers appear in February and March. Native of the Crimea.

C. Imperati (*Early C.*)—This is perhaps the earliest-blooming sort in cultivation, opening often in the first month of the year if the weather is mild. The flowers are lilac, marked with lines of deeper purple externally, and the throat is yellow and hairless. Native of Italy.

C. lacteus (*Milk-white C.*)—This sort has cream-coloured flowers and lemon-coloured anthers and stigmas. The petals

are roundly ovate, and when open assume the form of a shallow cup. A distinct sort, not so often seen in gardens as it ought to be. Flowers in February and March. Native of Greece.

C. nudiflorus (*Purplish Autumn C.*)—This is an autumn-flowering species, the flowers opening usually in October. The flowers are pale purple, with a dash of red, but uniform, not striped. The tube also internally is purplish and destitute of hairs. The stigmas are much divided and fringed, and are orange. Native of the south-western countries of Europe, and is a naturalised native in a few districts of England. It is readily distinguished from *Colchicum autumnale*, erroneously named Autumn Crocus in gardens, by having three instead of six stamens in the flowers, which otherwise somewhat resemble those of the *Colchicum*. Propagates and extends itself by means of runners underground, as well as by bulbs.

C. reticulatus, *syns. C. susianus and C. variegatus* (*Yellow and Brown C.*)—This is a common sort in gardens, easily distinguished from other yellow sorts by the conspicuous brown colour of the lower part of the petals externally. Native of the Crimea and southern Europe. A spring-flowering species, and one of the earliest.

C. sativus (*Saffron C.*)—This is an autumnal species. The flowers are violet, feathered, and veined with deeper shades of the same colour. The throat of the tube is bearded with lilac hairs. The stigmas are deep orange, divided into three large entire segments, toothed at the ends. The leaves become partially developed along with the flowers, but do not acquire their full development till spring. It does not give much satisfaction in wet or cold soils and situations, often dying out in such, and at best flowering very shyly. Native country unknown, but having been long cultivated for Saffron, the product of the stigmas, it is naturalised in many countries of Europe and some parts of Asia and Africa.

C. Sieberi (*Sieber's C.*)—This is an early winter-flowering species, the flowers beginning to open usually in November. They are small, soft pale violet, and the whole plant is comparatively diminutive. Only suitable for culture in light warm soils and sunny situations. Native of Greece, and introduced recently, and is yet rather high-priced.

C. speciosus (*Showy Autumn C.*)—A very handsome autumnal species, the leaves of which, like those of the Saffron C., do not attain their full development till spring or early summer. The flowers are large, purplish blue, feathered on the inside with lines of deep violet. The stigmas are large and conspicuous, being deep yellow or orange, divided into three fringed segments.

Flowers open in September and October. Native of Crimea and Transylvania.

C. vernus (*Vernal C.*)—Nearly all the common blue, purple, and white spring varieties of Crocus have sprung from this species, and it is the commonest and most widely-distributed as well as the most variable of the species in nature. I am not aware that any other species of vernal Crocus has the hairy tube which distinguishes this one in all its varieties. It is a native of nearly every country of southern Europe, and is a naturalised native of some parts of Britain.

C. versicolor (*Striped C.*)—This is another vernal species, and the parent of a good many varieties of white, lilac, purple, and grey-striped varieties occasionally seen in gardens. The varieties of this species are distinguished from those of the last by the absence of hairs on the throat of the flower, and by the stigmas, the lobes of which are usually more or less rolled back at the points, and by their being nearly equal in width throughout and generally entire. The lobes of the stigmas in the Vernal C. widen more or less upwards, are spreading, but not convolute, and are somewhat jagged or cut. Native of southern Europe.

Gladiolus.—This fine genus is well known in gardens in the numerous and splendid varieties commonly known as *Gandavensis* and *Ramosus* hybrids. These have quite eclipsed in popularity the few species that were formerly cultivated either in pots or in the hardy flower-garden. Their very beautiful and distinct features, and their colours, gorgeous and chaste, comprising many shades of red, white, yellow, purple, and combinations of these in the different varieties, need not be enlarged upon here, they are so familiar to all lovers of flowers. And the uses to which they are adapted in the embellishment of gardens are no less familiar and well understood. In mixed arrangements of colour they are indispensable, and for the back lines of large mixed borders, the centres of large beds, background lines for masses of colour, as well as for planting amongst low-growing shrubs, there are few of the gifts of Flora more suitable in all respects than the vigorous-growing varieties of the types above named; and the dwarf-growing kinds of both these types, and of the *Cardinalis* breed, as well as some species not so common, are more adaptable to a variety of positions requiring lowness of stature along with brilliant and attractive flowers. The varieties of all these sections are often recommended for massing on the "bedding-out" pattern; for this purpose they are not well suited. Neither their habit nor the style of their inflorescence is well adapted to that plan, and their shortlived

individual flowers, notwithstanding they are produced in long succession, are a still greater bar to their ever becoming favourites in that way. Although natives mainly of the Cape of Good Hope, these bulbs are perfectly hardy in many parts of this country, but they succeed best when lifted and planted annually, as is the practice observed with regard to half-hardy bulbous plants generally. They luxuriate best in a deep rich sandy loam, well drained, and the ground should be well tilled by deep-digging in winter; and any manure that may be applied should be well rotted, turned in pretty deep with the spade, and be mixed with the soil as well as possible. I have found peat a very congenial mixture to apply to the soil *Gladioli* are grown in; they grow very luxuriantly in it, and colour with remarkable purity when it abounds in the compost. The best time for planting for an autumn display is March, any time when the ground is in proper order for planting and being worked. In dry light soils, and in localities that are exempt from late frosts, they may be planted earlier, and successionally so late as April, for the purpose of prolonging the blooming season; but this is not practicable in late, cold, or wet localities, as the bulbs rarely ripen well if planted later than the last week in March; and if planted earlier than the beginning of that month, they are liable to rot before vegetation becomes active, and to be scathed with frost in May or June, if they should succeed so far. They may be planted in lines or in clumps, according to fancy or the object in view; if in lines, strong bulbs should be placed not nearer each other than 1 foot each way; if in clumps, five or six roots to each circle of 1 foot diameter will not be over-much, and the bulbs may be placed about 3 or 4 inches deep. I have said they succeed best in light, rich, deep, well-drained loam and peat, but they are by no means fastidious as to soil; they grow well in almost every soil if not absolute clay and wet, or gravelly, poor, and dry; in the former the bulbs are very liable to spot and rot, and in the latter they are equally liable to those evils, and become infested with red-spider to a fatal degree. Propagation is easily effected by husbanding the offsets which appear in greater or less quantity at the base of the flowering-bulbs. They should be stored by themselves till spring, and then be sown or planted in rich soil in a warm border. Two years' nursing is sufficient to bring the small bulbils of many of the varieties to flowering size. Any enumeration of varieties cannot be attempted here, but a few species worthy of notice for the mixed border are described below. Some of them, it will be found, flower earlier than the garden varieties, to which the above remarks mainly apply, and any necessary additional

information respecting their culture will be given in its proper place.

G. blandus (*Early Blush G.*)—This species grows about 1½ or 2 feet high, bearing rather a loose spike of pale-pink flowers, with darker spots at the base of the three lower segments. The flowers begin to open about the middle of June, and continue a few weeks. The plant is fond of peat. The bulbs must be lifted and replanted in autumn every second or third year, and it requires well-drained soil in order to keep it in good health continually. Native of the Cape of Good Hope.

G. byzantinus (*Turkish G.*)—This is another early-flowering species requiring the same treatment and circumstances as the last. The spikes are rather crowded, with numerous flowers arranged in two rows. The flowers are deep red, the three lower segments marked by a narrow white spot. The flowers open in June and July. Native of Sicily and the Abruzzi.

G. cardinalis (*Cardinal G.*)—A very beautiful species, not very fastidious as to soil, and very hardy, requiring the same treatment as the first-named species. The plant grows about 2 feet high. The spikes are rather short, crowded, and one-sided. The flowers are large, deep scarlet, with a conspicuous white spot on each of the three lower segments. They open in June and July. Native of the Cape of Good Hope. There are a good many fine varieties, all worthy of a place in collections.

G. communis (*Common European G.*)—This species, like the last, is not particular as to soil, thriving well in any moderately-good garden-soil, but otherwise requires the same treatment as the Early Blush G. The spikes are one-sided and numerous flowered. The flowers are rather small, and do not open wide, and are bright red; the middle lower segment is considerably larger than the other two, and all are marked by a narrow white spot. Native of south Europe. Flowers in June and July. There is a good white variety worthy of a place.

G. insignis (*Showy G.*)—This is a splendid species, growing from 2 to 3 feet high. The spikes are dense and one-sided. The flowers are large, brilliant orange-red, opening in June, July, and August. It is perhaps the most gorgeous of the early-flowering kinds, and is as hardy and easily managed as any, and requires the same treatment as the other early kinds above described.

G. segetum, syn. **G. communis** (*Purple European G.*)—This is a distinct and useful species, growing between 2 and 3 feet high, with numerous flowered spikes, the flowers being arranged in two rows; they are rather small, reddish-purple, and appear

in June. The plant is a most accommodating and hardy one. Native of southern Europe.

Iris.—This is a very ornamental and highly interesting genus of plants. The peculiar structure of the flowers, especially that of the stigma, and the fine showy colours, which in many cases are variegated in the most intricate and beautiful manner, mark the genus as one of the most distinct and desirable of all the hardy genera. The genus is divided into two sections very clearly by the character of the roots; one section, a small one, having tuberous roots, of which *I. xiphoides* is the most familiar example in gardens; the other section has fibrous roots, and a more or less creeping rhizome of a fleshy nature generally appearing on the surface of the ground. A well-developed and familiar type of this section is *I. germanica*, the most commonly seen of the rhizomatous Iris in our gardens and shrubberies. The tuberous Irises are more fastidious as to soil and situation than the other kinds. They thrive best in rich light soil, and prefer such a situation as will secure moderate shade for some portion of the day. Well-drained borders with an east or west aspect will meet their requirements well, and under such circumstances they are admirable ornaments for the borders of shrubberies and flower-gardens. All the species and varieties of this section require periodical lifting every two or three years; otherwise they decline in vigour, and are apt to descend too deep in the soil, cease flowering, and die. They are increased by offsets, and these are best encouraged by adding a quantity of good peat or two-year-old stable manure to the soil at planting, and the roots should not be placed deeper than 3 inches in the soil. The rhizomatous species and varieties succeed well in any ordinarily good garden-soil; particularly well, however, in light rich soils; they are consequently more generally adaptable to many purposes in the flower-garden. Many of the vigorous species are fond of moist situations, as by the banks of pieces of water and streams; and for adorning such places they are at once characteristic and beautiful. They may also be introduced and naturalised in open woods and banks, where the natural vegetation is not over-rank and powerful; and they are among the most choice of ornaments for the mixed border, and for mixing on the margins of shrubberies with other characteristic herbaceous plants or small shrubs. Propagate by division of the rhizomes. When the rhizomes rise too high above the surface of the ground, the plants require to be lifted and planted deeper; and this should be done in early autumn. All may be increased by seed, which should be sown as soon as it is ripe; and some of the species being variable, interesting variations

from the type may be procured by means of seed. The seed may be sown in pots in a cold frame or under a hand-light, or they may be sown in the open ground in a warm border, if it is only the commoner kinds that are being dealt with. The rhizomatous kinds will flower a little the second summer from seed, but the tuberous or bulbous kinds not till the third summer.

I. cristata (*Crested I.*)—This is a dwarf rhizomatous kind, rarely exceeding 6 inches high. The flower-stems barely exceed the length of the leaves, and each bears one or two flowers, the divisions of which are nearly equal in size, and are blue, shaded in deeper and lighter tints, and variegated with yellow. They appear in May, and last about a month. The plant succeeds well only in sunny positions and warm light soils, and is one of the very few species of *Iris* that are found in North America.

I. foetidissima (*Gladwin I.*)—A vigorous species of the rhizomatous section, growing $1\frac{1}{2}$ or 2 feet high, with deep-green leaves which smell disagreeably when bruised. The stems support numerous flowers of a livid-purple colour, but often in different plants variously coloured, from violet to dirty white. The segments of the flowers are unequal in size, the outer one being the largest. Flowers in June, lasting a few weeks. One of the best for naturalising in woods and shady places. There is a good variegated-leaved form, having the leaves striped with creamy white. Native of England, Italy, and France.

I. germanica (*German I.*)—The most ordinary colour of this species in nature and in gardens is blue, but it has sported into innumerable shades and variations under cultivation; and any of the varieties are well worth growing in any collection. In a general way the many forms of this species may be distinguished from those of most others in cultivation by the many-flowered stem, by the lower flowers being erect on short stout stalks, and by the large, nearly-equal, and round segments of the flowers. The varieties grow from 1 foot to 2 feet high, and are generally characterised by bold, stout, glaucous, or pale-green leaves. Some have splendidly-coloured flowers; others are perhaps more curious from the dinginess of their colour, but often, also, highly interesting from the picturesque lacing and network that is displayed in even the dingiest. Native of France, Germany, and western Italy. It is one of the rhizomatous species; and the flowers appear about May, June, and July, varying as to the time of opening in different varieties.

I. graminea (*Grass-leaved I.*)—This species grows about 9 inches or 1 foot high, with narrow, linear, bright-green leaves. The flower-stems support usually two flowers. The segments

of the flowers are narrow, egg-shaped, and variegated dull white, violet, or purple and yellow. They open in June. Native of many countries of southern Europe in pastures.

I. lutescens (*Pale-yellow I.*)—A dwarf species of the rhizomatous section, and very pretty and distinct. It grows about 6 inches high, with narrow short leaves. The stems bear usually only one flower each, which are pale yellow, netted with violet. They appear in April and May. It succeeds best in sunny warm positions. Native of southern France, Switzerland, and Carniola.

I. pallida (*Pale-blue I.*)—A fine vigorous species, nearly allied to the German I., but readily distinguished from it by the flowers being all stalkless, and by the tube of the flower being shorter. The flowers are soft blue, netted with green; they appear about the same time as those of *I. germanica*, but the plant is scarcely so tall. Native of Istria, Pavia, and Pisa.

I. pumila (*Dwarf Crimean I.*)—This is a dwarf rhizomatous species allied to the Pale-yellow I. It grows from 4 to 8 inches high, the stems bearing usually only one flower each. The flowers are large comparatively, and ordinarily deep blue; but there are a few varieties distinguished by other colours, as various shades of blue, yellow, white, and variegations of these; the petals or divisions of the flowers are rather unequal, the inner ones being the largest. Flowers in April and May. Native of Austria, France, and other countries of southern and central Europe; usually on dry stony hills.

I. reticulata (*Netted I.*)—This is a bulbous-rooted species of great beauty and distinctness, and one of the earliest to appear in flower. The flower-stems grow about 6 inches high, each supporting one flower, the segments of which are narrow, and are beautiful brilliant purple or violet, the outer ones being stained with rich orange. The leaves are four-angled, and exceed the length of the stems considerably when fully developed. The plant is not hardy in all localities, and is very impatient of cold wet soil. Like all the bulbous Irises it is very fond of peat, but succeeds well in rich, light, sandy loam, and should have a warm aspect in a sheltered warm situation. It is well worthy of pot-culture wherever it cannot be grown out of doors, succeeding well in a cold frame, and becoming a most beautiful object for the greenhouse or conservatory in February and March, but it will not endure much forcing. Native of the south of Europe and Asia Minor.

I. ruthenica (*Small grass-leaved I.*)—This is an attractive but diminutive fibrous-rooted species, with linear grass-like leaves somewhat exceeding in length the short flower-stems. The

flower-stems are from 4 to 6 inches high, each bearing only one flower of a deep purplish blue, the inner petals being much smaller than the outer ones. Very well adapted for the front lines of borders and beds, or for rockwork, and succeeds best in deep, well-drained, light, sandy loam. Native of Siberia. Flowers in May.

I. sambucina (*Elder-scented I.*)—This is a large-growing rhizomatous species in the way of the German I., but considerably more vigorous. The flower-stems reach the height of 3 or more feet, bearing numerous stalkless flowers. The leaves are broad, bright green, and sword-shaped. The flowers are dull purple. The segments are nearly equal in size, and the inner ones are notched at the points. Flowers in May and June. Native of southern Europe.

I. sibirica (*Hollow-stemmed I.*)—This species grows about 2 or 2½ feet high. The leaves are narrow, linear, and sharply pointed. The stems bear several flowers, and are hollow. The outer petals are largest, and all are blue, with deeper nettings of the same colour. Flowers in May and June. Native of Switzerland, Alsace, southern Germany, and Siberia.

I. susiana (*Chalcedonian I.*)—This is a splendid and distinct species of the rhizomatous section. It grows about 2 feet high. The flowers are very large; the inner petals are largest, the outer ones very much deflexed, and all are blue and very distinctly netted with deep-brown lines. The flowers appear in April and May. Native of the Levant. Very impatient of stagnant moisture, and will not long live in cold wet localities everywhere; it should have a warm sunny position.

I. tenax (*Tough-leaved I.*)—This is a dwarf species, rarely exceeding 1 foot high. The leaves are tough, and the whole plant is rather rigid. The flowers are large; the petals unequal in size, the outer being the largest, and spreading. They are purple, and the outer ones have a large blotch of white or yellowish white at the base. Flowers in April and May. Native of North America.

I. tuberosa (*Snake's-head I.*)—A handsome species of the tuberous or bulbous section. The leaves are triangular or four-angled. The flower-stems grow about 9 inches high, bearing each only one flower. The inner segments of the flower are blue, the outer deep purple and green. Flowers in March and April. Native of France and Italy. The plant is very fond of peat or well-decomposed leaf-mould well sharpened with sand, and enjoys a warm position, and is a very good pot-plant, and as such an excellent ornament of the greenhouse, but will not endure much forcing.

I. variegata (*Variegated I.*)—A rhizomatous species, growing about 2 feet high. The stems each bear several large flowers. The outer petals are notched or very blunt-pointed, the inner ones are rather sharp-pointed; all are yellow, netted with deep-brown lines. Native of southern Germany. Flowers in May and June.

I. xiphioides (*English bulbous I.*)—A very showy bulbous species, of which there are a good many varieties in gardens. It is the best known of the bulbous species. The stems rise 1 foot or 2 feet high, each bearing two or three large flowers. The petals are unequal, the outer being largest. The ordinary colour in nature is blue, and in different shades; it is also the most prevalent amongst the garden varieties; but there are white, yellow, and variegated sorts also, and all are extremely showy and beautiful. Flowers in June. Native of the Pyrenees.

I. xiphium (*Spanish bulbous I.*)—This is an equally handsome species, though not so showy as the last, and there are fewer varieties of it. It grows about 9 inches or 1 foot high, with narrow deeply-channeled leaves. Each stem bears two or three flowers with narrow nearly equal petals. The most common colour in nature appears to be blue, variegated with yellow; the offspring in gardens present various colours. Flowers in June. Native of Spain. This species and its varieties are fond of peat, but succeed well in rich, light, sandy loam.

Sisyrinchium.—This is a small genus of hardy and half-hardy herbaceous plants from both North and South America. They are very pretty border ornaments, with grass-like leaves and flowers of various colours, some being very showy and others pretty and fragrant. They grow best in rich, light, deep loam, well drained, in a warm sunny aspect. They are easily increased by division of the roots in early autumn.

S. anceps, syn. **Marica anceps** (*Two-edged S.*)—A dwarf-tufted species, with narrow linear grass-like leaves. The flower-stems are much compressed, and are sharply two-edged. The flowers are produced a few together at the top of the stem, and are beautiful bright blue, appearing in June and July. Height 6 to 9 inches.

S. convolutum, syn. **Marica convoluta** (*Yellow-spring S.*)—This pretty and attractive species is perhaps scarcely hardy in all parts of the country, but succeeds well in warm localities in the southern parts. The plant grows about 6 inches high, with foliage of the same character as the last, in rather dense tufts. The stems are compressed and two-edged, and support two or

three rather large bright-yellow flowers, which open in May and last till July.

S. grandiflorum (*Large-flowered S.*)—A very beautiful little plant, growing about 6 or 9 inches high, with very narrow lance-shaped leaves. The flower-stems are round, and support usually two or three very large cup-shaped, deep, reddish-purple flowers, opening in April, May, and June. There is a very important white-flowered variety, an excellent companion to the purple. The roots are tuberous, and the plant is fond of peat : it is one of the hardiest.

S. odoratissimum (*Most-fragrant S.*)—This species is not hardy enough to endure the winter in all parts of Britain. It grows about 1 foot high, with round stems and narrow milky-green leaves, sharply pointed. The flowers are borne in small trusses at the top of the stems. They are white, with long tubes, and highly fragrant. They open in June and July. Worthy of, and requires, a fine sunny position.

AMARYLLIDÆ.

This is a splendid order of bulbous-rooted plants. The greatest number of the species are greenhouse and stove bulbs of most brilliant beauty, and a good many are half-hardy and adapted only for culture in warm borders in front of hothouses or greenhouses ; there remains, however, a large group of beautiful and fragrant species that are hardy and adapted to culture in the open air in all parts of the country, and from these only are the following selections made. Not one-tenth of the genera of the order can be included in this hardy group ; but the names *Narcissus*, *Snowdrop*, *Leucojum*, and *Alstrœmeria*, which yield the largest number of the hardy species, will be a sufficient gauge of its value to the hardy-flower gardener without further comment. The *Amaryllidæ* are very commonly confounded with the much more extensive and more heterogeneous *Liliacæ* in gardens. The best general distinctive feature lies in the position of the ovary in relation to the perianth or flower : in *Amaryllidæ* the ovary is inferior—that is, under the perianth ; in *Liliacæ* it is superior, or detached from the perianth.

Alstrœmeria.—This is a succulent tuberous-rooted group of very distinct aspect, and beautifully as well as singularly coloured flowers. They are free-flowering plants, adapted for culture in the mixed border. There is a not uncommon impression that

many of the species are not hardy. Most of them are apt to suffer fatally in wet spongy soils; but in dry, well-drained sandy loam they resist the cold of our winters very successfully. They are best adapted for growing in dry soils of a sandy nature: in strong heavy loams and clays, even if they live, they rarely flower well, but produce instead of flowering-stems a preponderance of weak barren ones; and in such soils also they are much more apt to spread beyond due limits—a tendency which they have in greater or less degree in all soils. The only practical corrective to this tendency is to plant the roots in a large pot, well drained, and sink the pot in the border with the rim about 3 inches under the surface, taking care annually to lift the pot and examine the contents with the object of repairing drainage and adding a little fresh soil. They are exceedingly easily increased: the fleshy roots, producing buds from nearly every part of their surface, offer an abundant means of propagation. They should be divided in autumn, where the soil is of that character which has been described as most congenial; but if wet it is better done in early spring; and the roots, when planted, should be placed not less than 3 inches deep. Wherever it is anticipated that the combined influence of cold and wet would injure them, they will be rendered safe by having a mound of coal ashes or old tan raised over them.

A. aurantiaca (*Orange-spotted A.*)—This species grows about 2 feet high, with rather wiry flexible stems, clothed with lance-shaped leaves, and terminating in umbels of orange-and-yellow flowers, appearing in June and July. Native of Chili.

A. Errembaultii (*Errembault's A.*)—This is said to be a hybrid sort, and is very distinct and beautiful as well as hardy. It grows about 2 feet high, with erect stems, clothed with lance-shaped leaves. The flowers are produced in few-flowered umbels, and are white spotted, with deep crimson or red and yellow. They open in autumn.

A. hæmantha (*Blood-red A.*)—A more dwarf and compact species than the last, growing erect, about 18 inches high, with numerous stems. The leaves are narrow lance-shaped, and very slightly fringed with soft hairs. The flowers, in umbels, are deep purplish red and orange, and appear in August and September. Native of Chili.

A. psittacina (*Parrot A.*)—A very distinct species, growing about $2\frac{1}{2}$ or 3 feet high. The stems are erect, clothed with lance-shaped sharp-pointed leaves, and terminate in considerable umbels of crimson and green flowers, which appear in August, September, and October. Native of Mexico.

Galanthus nivalis (*Snowdrop*).—Little need be said here

about this long-established spring favourite. It is known to and admired by everybody. Its culture is simple and equally well known ; but because it is so simple, and demands so little attention, it very often gets less paid to it than it deserves. How few ever look back to the clumps of Snowdrop after they have been committed to the ground ! and yet they are the better for being occasionally lifted and divided. The best time for doing this is immediately after the leaves are ripe. The bulbs should be placed about 2 inches deep ; and it may be planted everywhere, for it is rarely in the way, and is always welcome. Native of many countries of Europe, and abundantly naturalised in Britain.

G. plicatus (*Crimean Snowdrop*).—This is a stronger-growing subject than the last, producing flowers of greater substance, and longer and broader leaves, which differ also from those of the common Snowdrop in having two longitudinal plaits extending from base to summit of each leaf. Native of the Crimea, and flowers at the same time as *G. nivalis*.

Leucojum (*Snowflake*).—This genus resembles the last in general aspect, but is always easily distinguished by the divisions of the perianth being equal in length, while in Snowdrop the inner ones are shorter than the outer ones. They thrive well in any good garden-soil. *L. autumnale* is very partial to peat, and succeeds better in it than in loam alone ; but, indeed, they are all fond of peat, although it is not essential, except in very heavy soils, when, to all except *L. æstivum*, it is necessary to give a good mixture of either peat or leaf-mould and plenty of sharp sand. Increase by division of the bulbs, which should be attended to when necessary immediately after the foliage is ripe.

L. æstivum (*Summer Snowflake*).—This is the most vigorous and least valuable of the group, yet is a handsome and pleasing plant. The leaves are a foot or more long. The flower-stalk rises about 18 inches high, bearing a few white drooping flowers at its extremity. The flowers open in April and last till June. Native of Britain and other countries of Europe. The plant may be used in the same way as that in which Snowdrop is used for the ornamentation of glades and open woodland walks, but prefers a moister soil than does the Snowdrop.

L. autumnale (*Autumn Snowflake*, syn. *Acis autumnale*).—This is a pretty, little, weakly plant, requiring a warm dry position and soil, such as has been already named in the introductory remarks. The leaves are very narrow, 6 or 8 inches long. The flower-scapes are about 6 inches high, supporting several small flowers, either pure white or white suffused with rose.

They open in September, and continue a few weeks. Native of Corsica, Sardinia, Nice, and Sicily.

L. vernum (*Spring Snowflake*).—This is the gem of the family. It produces stout, broad, Snowdrop-like leaves, only partially developed at the time of flowering. The flower-scapes rise to the height of about 9 inches, supporting each one large, pure white, very fragrant flower, the petals being distinctly tipped with bright green. They open in February and March. Native of many districts of Europe. It is too rare and valuable at the present time to be recommended for naturalising; but when sufficiently plentiful, it will be found equally easy to establish in woods and banks as the Snowdrop itself, and being rather later in blossoming, as well as like it in colour and style, it will help in the course of time to eke out a little longer the enjoyment of the attractions of that common favourite.

Narcissus.—This is another familiar group of bulbous plants. The common white Narcissus and the Daffodil are to be seen in nearly every garden in the country. There are other and rarer species seen occasionally in private gardens, but I do not know that any of them are superior in floral effect and fragrance to the different varieties in those two colours generally cultivated. There are a good many distinct forms, however, which are worthy of a place in every collection of mixed herbaceous plants. All the *Narcissi* are comparatively easy to cultivate. They prefer a light, rich, warm soil, but the stronger-growing kinds are not very particular as regards soil, and such may be introduced into woods and pastures with good effect and certain success. They are propagated by offsets, and some kinds produce these much more freely than others, but all increase more freely when planted in peat than they do in any other soil.

N. angustifolius, *syns. N. majalis and N. radiiflorus* (*Narrow-leaved N.*)—This species grows from 9 inches to 1 foot high. The leaves are linear, nearly as long as the scape, which is compressed, and has two sharp edges. The flowers are white, fragrant, and the divisions radiate quite clear of each other; are broadest in the middle, and diminish in width much towards the base and a little also towards the point. The crown is somewhat in the way of that of the Poets' Narcissus. Flowers early in April. Native of Austria and the Alps of central Europe.

N. biflorus, *syns. N. dianthus, N. triflorus, and N. poeticus* (*Two-flowered N.*)—A vigorous sort, with broad glaucous leaves, about a foot or more in length. The flower-scapes

are compressed, and have two prominent edges, and support two large flowers. The divisions of the corolla are milk-white, broad, and overlapping each other, and the crown is yellow, slightly cup-shaped, and toothed and wrinkled on the edge. Flowers in May. Native of Britain, France, Switzerland, and the Tyrol.

N. Bulbocodium, syn. **Corbularia Bulbocodium** (*Hoop-petticoat*).—A very pretty species, with flowers somewhat resembling those of the commoner forms of Daffodil. The leaves are narrow, thick, and roundish, 6 to 9 inches long. The flower-scape is about as long as the leaves, bearing a single flower $1\frac{1}{2}$ inch or rather more long, with a very conspicuous crown widening upwards, and the divisions of the corolla narrow, sharp-pointed, and wide apart; and the whole flower is bright yellow. There are several more or less well-marked varieties of this form which, along with the type, are in many works regarded as a distinct genus under the generic synonym already given. The best of these for garden purposes is *N. B. conspicuus*, syn. *C. conspicua*. Flowers in May. Native of southern Europe.

N. gracilis, syn. **N. tenuior** (*Slender yellow N.*).—The leaves are narrow, about 1 foot long, somewhat channeled, and bright green. The flower-scape is nearly round, about the length of the leaves, and supporting usually two pale-yellow flowers; the divisions of the corolla are broad, sharp-pointed, and somewhat overlapping at the base. The crown is very shallow, cup-shaped, and slightly darker yellow than the rest of the flower. Flowers in April.

N. Jonquilla, syns. **Queltia Jonquilla**, and **Jonquilla major** (*Jonquil*).—This is a well-known and very fragrant species. The leaves are about 1 foot long, narrow, and nearly round, and dark green. The flower-stems are about the length of the leaves, supporting several bright-yellow flowers. The segments of the corolla overlap at the base, swelling in width towards the point, but contracting sharply to an acute point. The crown is narrow and shallow, and almost without wrinkles on the edge. There is an important double form, and there are varieties of greater or less stature, and with smaller or larger flowers. Flowers in April and May. Native of southern Europe.

N. Macleaii, syn. **Queltia Macleana** (*M'Leay's N.*).—The leaves are about half an inch broad, and about 9 inches long, slightly channeled. The flower-stalk is about 1 foot in height, slightly compressed and two-edged, bearing usually one, but sometimes two flowers. The segments of the flower are broad, overlapping each other at the base and a good part of their

length, and they are white. The crown is about half an inch deep and the same width, and bright yellow. Flowers in April and May. Native of the Mediterranean.

N. odorus, syn. **Queltia odora** (*Fragrant yellow N.*)—The leaves are about $\frac{1}{4}$ inch broad, and about 1 foot long, and rather deeply channelled. The flower-scape is 1 foot or more in height, nearly round, supporting generally several flowers. The flowers are bright yellow; the divisions overlap each other for a good part of their length. The crown is about $\frac{1}{2}$ inch deep and about as wide, and slightly wrinkled. Flowers fragrant, appearing in April and May. Native of southern Europe.

N. poeticus (*Poet's N.*)—This is the deliciously-fragrant, chastely-beautiful white Narcissus, with the crimson-edged, saucer-shaped crown that is so universally admired, and so very generally grown in all classes of gardens. Description of so well known a favourite is needless, and its beauty and sweetness are more powerful recommendations than words of mine could be. But it is deserving of more extensive patronage than, with all its popularity, it at present receives. It is accommodating and hardy, and may be naturalised on banks and in open woods, while it should ever be in profusion in the more frequented parts of gardens and grounds. Like most of the *Narcissi*, it is easily forced in pots if the process is not too hotly conducted. The bulbs should be potted in autumn, before activity or root-action commences in them, and be stored away with the pots plunged to the rims in a cold frame, until the pots are filled with roots, when they may be transferred to a warm frame, greenhouse, or parlour, to develop their flowers. There are many varieties, distinguished by trifling and not always constant characters, but the best for garden purposes is, perhaps, *N. p. grandiflorus*, which flowers slightly earlier than the ordinary form, and has larger flowers with very broadly overlapping segments. The double varieties will also be admired by many, and are well worth growing, being as easily cultivated as the single ones. Native of southern Europe. Flowers in May.

N. pseudo-narcissus (*Daffodil*).—This is perhaps even more commonly cultivated than the last, though less worthy and admirable. The ordinary form need not be described here, it is so well known; but there are several well-marked varieties not so generally cultivated in private gardens deserving more particular mention, especially as they are vended under specific names. *N. pseudo-narcissus* var. *bicolor* is known under numerous synonyms, as *N. Ajax*, *Ajax bicolor*, and *A. lorifolius*. It has the leaves about 1 foot long, and the flower-stalk about

the same length. The flowers are about the usual size of the common Daffodil, and similar in structure, but the crown is bright yellow, while the divisions of the corolla are pale creamy white. *N. pseudo-narcissus* var. *major* is known under the following names in nurseries: *N. Ajax* var. *major*, *Ajax lobularis*, *A. leuteus*, and *N. grandiflorus*. It is chiefly remarkable for its excessive vigour and size of leaf and flower. The flower, including the crown, is uniform pale yellow; the divisions of the corolla are broad, long, and spreading; the crown also is very long, spreading, and bell-shaped. Double forms of this, as well as the common form of the species, are common. *N. pseudo-narcissus* var. *minor* is cultivated under the names *N. minor pumilus* and *pygmæus*, and *Ajax minor* and *pumilus*. It is the most distinct of the group, and remarkable for its small size. The flowers are bright yellow, the crown and divisions of the corolla uniform in shade, and the whole plant does not exceed 6 inches high. *N. pseudo-narcissus* is a native of Britain and many districts of southern Europe, and is one of the easiest of all the *Narcissi* to naturalise wherever it may be desirable. The flowers appear in March and April in the ordinary form, but in some of the varieties they do not open till the latter month—this is notably so in the bicolor variety, which does not flower till about the middle of April, and on through May.

N. Tazetta (*Polyanthus N.*)—This is the species whence the varieties of *Polyanthus Narcissus*, commonly grown in pots for greenhouse and room-decoration, are derived. *Bazelman major*, *Grand monarque*, and many other names commonly found under the head *Narcissus* in bulb catalogues, are applied to more or less distinct forms of the south European *N. Tazetta*. These varieties differ from what is regarded by botanists as the type only in degrees of luxuriance, and in the relative colour of the crown and the divisions of the corolla. All are hardy, and all are beautiful as well as fragrant; and in forcing they have proved more successful than most of the other *Narcissi* that have been tried for that purpose. The type has flat unchanneled leaves about 1 foot long, slightly glaucous, and usually blunt or rounded at the point. The flower-stalk is about the length of the leaves. The flowers are produced in clusters at the top of the stalk. The divisions of the corolla are milk white or creamy white, overlapping each other, and bluntly pointed; the crown is bright yellow, cup-shaped, and about $\frac{1}{4}$ of an inch deep. The flowers open late in March and in April. The plant is not only a native of southern Europe, but of Syria and northern India.

Sternbergia.—This is a small genus of diminutive bulbs, only

one species of which is at all well known in cultivation, but fortunately it is the best of the little group for garden purposes. It grows well in any ordinarily good garden-soil, but best in that which is light, rich, and well drained. They are most fit for the front lines of mixed borders, the margins of shrubberies, and they may be planted in such points on rockwork as may be favourable for exhibiting their pretty but diminutive display. The roots are best planted in spring. Besides the species described below, there are *S. clusiana*, with pale-yellow flowers and unchanneled glaucous leaves, flowering in autumn; and *S. colchiciflora*, dwarfer than the others, and with yellow flowers appearing without the leaves in autumn; both are very rare in cultivation.

S. lutea, syns. **Amaryllis lutea** and **Oporanthus luteus**.—The leaves are about 6 inches long, prominently keeled on the under side. The flowers are erect on the top of the scape, solitary, and bright yellow, having six bluntish lance-shaped divisions 1 inch or more in length. The whole plant is about 6 inches high. Native of Montpelier and many districts of southern Europe. Flowers in September and October.

LILIACEÆ.

In this natural order there is a very extensive gathering of very diverse plants, varying very much in nearly every character, and agreeing only in the general structure and relative position of the ovary and perianth. By far the largest bulk of the order is made up of hardy and half-hardy plants; many are bulbous, others are fibrous and fleshy-rooted, and some have creeping underground stems and fibrous tuberous roots. It comprises a large number of splendidly ornamental plants, and many less assuming, but very fragrant, and otherwise desirable subjects; and there are spring, summer, and autumn flowering species in such wealth as that representatives of *Liliaceæ* may never be wanting in any garden in these seasons.

Allium.—There are one or two species of Onion well worth growing for their ornamental merits, but a very small selection will suffice. They are easily grown in any ordinary garden-soil, and propagated by the natural increase of the bulbous roots, and are best adapted for culture in the mixed border or in the margins of shrubberies.

A. Moly (*Great Yellow Onion*).—The leaves are produced in

tufts immediately from the roots, and are broadly lance-shaped and pale glaucous green. The flowers are in umbels terminating the scape, which is from 18 inches to 2 feet high. The petals are bright yellow, and open in June, continuing for some weeks. Native of the south of Europe.

A. roseum (*Rosy-purple Onion*).—This species is smaller in every way than the last. The leaves are narrow, lance-shaped, flat, and not confined to the root, but clothing and clasping the scape. The scape is about 1 foot high, supporting a crowded umbel of rosy-purple flowers, which appear in June. Native of France and Italy.

Anthericum.—This is a profuse-flowering elegant genus, comprising a few hardy species, with bundled thick fibrous roots. They delight in rich light loam, but succeed very well in nearly all soils, and are easily increased by division in autumn or spring. They are most useful for the mixed border and for ornamenting the margins of shrubberies; and all the hardy species are white-flowered, and flower about the same time, but are sufficiently diverse in style to be admitted in any considerable collection.

A. Liliago, syn. **Phalangium Liliago** (*St Bernard's Lily*).—The plant grows about 1 foot or 18 inches high, the leaves are narrow, channeled, in considerable tufts. The flower-scape is simple, or rarely in luxuriant plants branched, and produces lengthened racemes of pure-white flowers. The flowers are open and spreading, and the style is bent. Native of France, Germany, and Italy. Flowers in May, June, and July.

A. Liliastrum, syns. **Paradisica Liliastrum** and **Czackia Liliastrum** (*St Bruno's Lily*).—This species grows about the same height as the last, but the leaves are flat or only channeled below. The scape is simple. The flowers are larger than in the last, and not spreading but bell-shaped. Native of the Alps and Pyrenees.

A. ramosum (*Branching A.*)—This is more nearly allied to the first than the last species. The leaves are channeled, 1 foot or more long, narrow and grass-like. The flower-scapes are longer than the leaves, producing branched racemes of white flowers, the divisions of which are narrow and spreading. Height about 2 feet. It is seen in gardens and nurseries often with the erroneous name *graminifolium* attached to it—a name which rightly belongs to another and tender species. Native of France, Germany, and Italy.

Asphodelus (*Asphodel*).—A very handsome and distinct genus, with bundled, fleshy roots, and numerous white or yellow flowers in open or crowded, branched or simple, racemes

or spikes. They luxuriate best in deep, rich, rather moist loam, and are available either for the mixed border or for introducing amongst shrubs; and the stronger-growing species are also very fit subjects for naturalising in open moist woods, and by the banks of streams and pieces of water. All are easily increased by division in autumn or in early spring.

A. creticus, syn. **A. capillaris** (*Dwarf Yellow Asphodel*).—This species grows about 18 inches or 2 feet high. The stems are clothed with narrow, linear, dark-green leaves, diminishing in length as they ascend, and disappearing altogether some way below the raceme. The raceme is rather open, and the flowers are yellow, appearing in June and July. Native of Candia.

A. fistulosus (*Hollow-leaved Asphodel*).—A very distinct species, but not one of the most ornamental. The leaves are all confined to the roots, and are produced there in dense masses, and are roundish, hollow, and about 2 feet long. The flower-stems are erect, about $2\frac{1}{2}$ or 3 feet high. The racemes are rather loose, and the flowers are white, appearing in June and lasting a month or two. Native of France and Italy. One of the best for naturalising, and least worthy of an important position.

A. luteus (*Tall Yellow Asphodel*).—This is one of the handsomest of the species. It grows about 3 feet high, the stems being clothed to the base of the raceme with the triangular narrow-tapering leaves, which are dark green, and marked with narrow longitudinal lines of a paler colour. The racemes are dense and erect, and the flowers bright yellow, appearing in May, June, and July. Native of many countries of southern Europe.

A. ramosus (*Branching White Asphodel*).—This is a bold striking species, growing in rich moist soil often to the height of 5 feet. The leaves are all radical, and are sharply keeled on the under side and channeled above, and 2 or more feet long. The stems are smooth, round, and branch out freely into bold open racemes. The flowers are white, and appear in May and June. Native of France, Italy, Corsica, and Sardinia.

Bulbocodium vernum (*Spring B.*).—A very pretty little plant at first sight, resembling a Crocus, but easily distinguished from that genus always by the six stamens and the inferior perianth; and further distinguished by the structure of the bulb and its covering, which is of a downy nature, not fibrous, as in the case of the Crocus. The plant grows well in any good, light, well-drained loam, and is increased by division of the roots, which should take place immediately the leaves are ripe. The flowers appear in February and March, a short time before the leaves,

and are erect, only an inch or two above ground ; they open Crocus-like, and are deeply divided into six lance-shaped rosy-purple segments. The leaves are lance-shaped, channeled, or concave on the upper side, and ultimately grow about 9 inches long. Its very early-flowering quality should render it popular in gardens of all classes when it becomes better known, but at present it is not often seen in private gardens. Native of mountain pastures on the Alps and Pyrenees.

Camassia esculenta (*Quamash*).—A very handsome bulbous plant, but the flowers are not very lasting. The leaves are all radical, or having one or two only developed at the base of the stem. They are lanceolate, weak, and shortlived. The flower-stems are garnished with several flabby leaf-like appendages, and produce a long, graceful, loose raceme of soft purplish-blue flowers, $1\frac{1}{2}$ or 2 inches across. They appear in July. The plant succeeds best in peat and loam, and requires ample supplies of moisture in the growing season; drought, indeed, is death to it, but stagnation is equally to be avoided. Division should be done when needful, immediately after the foliage is ripe. Native of Columbia. Height of scapes about 18 inches or 2 feet.

Chrysobactron Hookeri (*New Zealand Asphodel*).—A very beautiful plant, with the aspect of some of the Asphodels. The leaves are strap-shaped, channeled at the base, 9 inches to 1 foot long, and all are radical. The scape is 1 foot or 18 inches high, supporting a handsome raceme of beautiful golden-yellow flowers, which open in May and June. Native of New Zealand. It succeeds best in moist peat and loam, in a moderately sunny position, and is quite hardy. Propagate by division in early autumn or spring.

Colchicum (*Meadow Saffron*).—These are very wonderful plants, and withal beautiful. They are wonderful, especially as regards the manner of and the time required for the production of seeds. All are autumn-flowering plants, and very late in that season it generally is in most parts of the country before they do open their flowers, and they die off without leaving a trace behind of the usual seed-vessels that follow after flowers. The seeds, however, are formed, and safely stored up, deep down in the earth away from danger, where they lie till spring comes round and calls them forth, after months of burial, to mature their development above ground. They succeed best in moist, deep, sandy loam, but do very well in a variety of soils, and are propagated by offsets, which they produce freely.

C. autumnale (*Common Meadow Saffron*).—This is very commonly in gardens named Autumn Crocus. It is one of the

latest flowers to appear in our beds and borders out of doors. The flowers appear alone, without leaves, and consist of six lance-shaped somewhat spreading petals, rosy-purple in colour, and supported only an inch or two above ground. The leaves begin to grow after the flowers cease, and reach their fullest development the following spring and early summer. They are lance-shaped, dark olive-green, and about 9 to 12 inches long, and 1 or $1\frac{1}{2}$ inch broad. Flowers in September, October, and November. Native of moist pastures in Britain and many other countries of Europe. There are several varieties, amongst which the double-flowered and the white are the most useful for gardens; and there is another with variegated flowers, the variegation consisting in deeper and lighter shades of purple, which sometimes does duty as a species under the name *C. variegatum*.

C. Bivonæ (*Narrow-leaved Meadow Saffron*).—This species has the same habit of flowering without the leaves as the last; but the leaves are narrower and shorter, and the divisions of the corolla are broader and blunter, and are marked by prominent veins. The flowers appear about the same time as those of the last. Native of Sicily and Sardinia.

There are several other forms of Meadow Saffron in cultivation, but as they all resemble each other more or less closely, and flower nearly about the same time, the above are all that need be described here. The following are desirable when the collection is large:—*C. byzantinum*, very free-flowering, and with short broad leaves; *C. montanum*, the leaves narrow, lance-shaped, appearing with the flowers, and much more spreading than is usual with those of the other species.

Convallaria majalis (*Lily of the Valley*).—This deliciously fragrant and elegant plant is a very old and still popular favourite with all lovers of flowers. There are few cultivated plants that yield so much gratification at so little cost of trouble and expense. It grows and flowers well in nearly every kind of soil that is not subject to severe drought; and once it is planted it may be left a lifetime to itself without suffering any diminution of vigour, if a little annual top-dressing of old manure and fresh loam be sifted on to the surface of the bed. It is essentially a plant for furnishing material for bouquets and room-decoration, and in no sense can it be regarded as a good border ornament; it should therefore have some handy spot in the garden devoted to itself, which may always be accessible to the ladies of the establishment. It prefers shade, being a native of woods and bushy pastures and moist valleys, but will do well fully exposed to the sun if the soil is not extremely dry; and

it is well to have it planted in various aspects, as by that means a lengthened succession of the flowers is enjoyed. There is no better plant for forcing for the decoration of rooms and conservatories; and for this purpose large supplies of roots are annually imported by British nurserymen and florists at great expense to meet the demand for it, which is great and increasing. It may be naturalised in moist places in open woods where the natural herbage is not rampant or can be kept in check, and it may be introduced into spaces between shrubs. There are several varieties—one with double flowers is not worth growing beside the normal form; there is also a pretty rose-coloured variety which has often specific dignity put upon it under the name *C. rubra*; and there is a pretty striated-leaved form well worth a place in borders for the sake of the elegance of the yellow-and-green-lined foliage.

Erythronium.—A small genus of low-growing, bulbous-rooted plants, in which the leaves are all radical. The Dog's-tooth Violet, *E. dens-canis*, is not an uncommon species, but not so common as it deserves to be in gardens of all classes. They are very accommodating as regards culture, thriving well in any good rich loam, but preferring peat or a mixture of peat and loam, and are easily propagated by offsets, which are freely produced. Division should be attended to immediately after the leaves decline. They are suitable for culture on the rock-work in the mixed border, and for fringing beds of shrubs; and being spring-flowering plants, they are available and very suitable for spring "bedding-out."

E. americanum (*Yellow Dog's-tooth Violet*).—This form produces broadly lance-shaped brown-spotted leaves, whence spring the short scapes supporting one large yellowish flower. The flowers appear in April, and last about a month. Native of North America.

E. dens-canis (*Common Dog's-tooth Violet*).—This species has broadly-ovate, brown-blotched leaves. The scapes are rather longer and more slender than in the last, and each scape supports a solitary flower with long lance-shaped petals, reddish-purple in colour. They open in March and April. There are two varieties in cultivation besides the typical sort, both worthy of a place in collections for variety's sake—the one has dull white, and the other paler purple flowers. Native of the alpine countries of Europe.

Another species formerly in cultivation, but now, I fear, lost, is *E. giganteum*, a native of North America. It has broad, blunt, ovate, brown-spotted leaves. The flowers are white, with a yellow centre, and are produced two or three together

on the scape. It is the most distinct of the genus, and worth looking after.

Fritillaria (*Fritillary*).—This is a large genus of elegant and attractively curious rather than showy plants. They are striking and interesting ornaments of the mixed border. They thrive in any good loam—the richer the better; but they are impatient of stagnant moisture, and equally so of extreme drought. They are increased by the natural development of offsets from the older bulbs, and the division should take place immediately after the leaves and stems decay; and all are invigorated by periodical lifting and replanting, say every three or four years.

F. imperialis (*Crown Imperial*).—A stately, striking plant, growing erect, 3 or 4 feet high. The stems are clothed with leaves for fully half their length, the upper part being naked and terminating in a head of large pendulous flowers, surmounted by a crown of leaves. There are several varieties differing in the colour of the flowers—one termed *flava* has yellow flowers, and is rather more robust, though not more showy, than the others; another variety has orange-coloured flowers; and a third has the flowers showy red. Besides these, there is a handsome variegated-leaved sort well worth a place. The Crown Imperial is a native of Persia.

F. Meleagris (*Snake's-head F.*)—This is a peculiar and elegant dwarf species indigenous to Britain and other countries of Europe. It grows about 1 foot high, erect, and the stems are clothed with lance-shaped glaucous leaves from base to top. The flowers are solitary, drooping from the summit of the stem, are widely bell-shaped, incurved at the mouth, and prettily marbled with reddish-purple on a dull white ground. They appear in March, and last a month or two. Of this species there are also two or three distinct varieties as regards the colour of the flowers, and there is one with double flowers quite unworthy of a place except as a curiosity. The most distinct and desirable of the others is the variety named *F. M. alba*; and there is a dusky yellow sort well worth a place for variety's sake.

F. nigra (*Black F.*)—A very distinct species, rather taller than the last, with erect stems clothed with narrower lance-shaped glaucous leaves. The flowers are solitary, drooping from the top of the stem; they are bell-shaped, with a narrower base than that of the last species, and the divisions of the corolla reflex at the mouth, showing somewhat of the greenish-yellow colour of the interior of the flower. Externally they are

dark reddish-brown, without any markings. They open in May. Native of the Caucasus. Other dwarf species of *Fritillary* worthy of cultivating in large collections or small, where they are admired, are *F. obliqua*, with purplish-brown flowers, opening in April; *F. græca*, very dwarf, with brown and reddish marbled flowers, appearing in June and July; and *F. tristis*, also very dwarf, with reddish-brown unmarked flowers, yellowish internally, and opening in April and May.

Funkia.—A handsome genus of bundled fibrous-rooted plants from Japan; but the species are hardy in all parts of the country. They are nearly allied to *Hemerocallis*, and some of the earlier-discovered species were included in that genus. They are more remarkable for their neat habit and the fine character of their foliage than for the showiness of their flowers, although they also are handsome, and in some cases also fragrant. They grow best in light, rich, sandy loam, and are fond of peat, but succeed well in a variety of soils, and are easily increased by division of the roots in early spring. They are best adapted for border decoration.

F. grandiflora (*Large-flowered F.*)—This species produces wide-spreading masses of large pale-green leaves, egg-shaped, and slightly heart-shaped at the base, the ribs or veins being numerous and prominent. The flower-stems are about 18 inches high, terminating in a short raceme of pure-white flowers, which open about July.

F. lancifolia (*Lance-shaped-leaved F.*)—A smaller species than the last. It produces tufts of broadly-lance-shaped leaves, narrowing towards both ends from the middle. Flower-stems about 9 inches high, terminating in an open raceme of few pale-blue or lilac flowers: they appear in the end of summer and in autumn. There are some interesting varieties of this species, chief amongst which are the white-flowered *F. l.* var. *alba*, *F. l.* var. *albo marginata*, having a narrow line of white along the margin of the leaf, and *F. l.* var. *undulata variegata*, in which the leaves are undulated on the margin and variegated on the greater part of the surface.

F. ovata (*Egg-shaped-leaved F.*)—A large-growing species, producing ample tufts of broadly-egg-shaped, acute-pointed leaves. Flower-stems 1 foot or 18 inches high, terminating in a short raceme of lilac-blue flowers, which appear in late summer and autumn. There is a handsome variegated-leaved form of this species.

F. Sieboldiana (*Siebold's F.*)—A very distinct species with ample roundly-egg-shaped, abruptly-pointed, deeply-glaucous leaves. The flower-stems grow about 1 foot high, supporting

a short raceme of very pale lilac flowers, opening in early summer.

F. subcordata (*Cordate-leaved F.*).—This is a large-growing species, but less ample as regards the size of the leaves than the first and the two last noticed. The leaves are egg-shaped, and slightly heart-shaped at the base. The flower-stem rises about 18 inches high, supporting a raceme of large pure-white flowers, which open about the same time as those of the last. There is a very important variegated-leaved form of this, commonly known as *F. japonica variegata*.

Hemerocallis (*Day Lily*).—A beautiful group of plants, with lily-like flowers and bundled fibrous roots, and the leaves mostly radical. All are handsome border ornaments, and the flowers of most are fragrant. They grow well in any good garden-soil, and are not averse to partial shade and moist places, and would therefore in the stronger species be available for introducing into groves, and by stream and pond sides. Propagate by division, which should be effected in autumn or early spring.

H. disticha (*Orange Day Lily*).—This species produces massive tufts of narrow bright-green leaves, keeled on the under side, and arranged in two opposite rows. The flower-scapes rise to the height of about 2 feet, overtopping the mass of leaves, and supporting a few large open flowers; the segments, six in number, are orange-coloured and reflexed, and the margins are undulated. Flowers in May and early summer. Native of northern China.

H. flava (*Yellow Day Lily*).—A very showy and good border-plant, growing about the height of the last. The leaves are similar in form to those of the last species, but are not so regularly arranged in rows; the scapes are about the same height, and support a few large bright-yellow well-opened flowers, but the segments are very slightly reflexed and the margins plain. Flowers in June and July. Native of Siberia and southern Europe.

H. fulva (*Coppery Day Lily*).—This is a larger-growing plant than either of the two preceding. The leaves are long, wide-spreading, broader, and pale green, and the flower-scapes rise to the height of 3 feet or more in moist rich soils. The flowers are large and the segments reflexed when fully expanded; the three outer ones are narrower than the inner ones and plain, and the inner ones are wavy on the margin, and all are coppery red. Flowers in summer. Native of the Levant.

H. graminea (*Grass-like Day Lily*).—The smallest species of the group, and very compact and handsome. The leaves are

narrow-linear. The flower-scapes rise to the height of about 1 foot, supporting two or three flowers, the segments of which are all more or less wavy and reflexed, and of a clear pale yellow. They open in June and last for a couple of months. Native of Siberia.

Hyacinthus (*Hyacinth*).—This is a very familiar genus of beautiful bulbs. The species *H. orientalis* is the parent of the innumerable and brilliant varieties so largely imported from Holland, to meet the demand for it in this country, both for forcing and hardy-flower garden embellishment. Most people know something of the management of these bulbs in pots and glasses, but few amateurs appear to be aware of the fact that they may be cultivated out of doors at less cost per hundred than they pay annually per dozen for the kinds usually grown in rooms and small greenhouses by them. The same roots will last for years without any diminution of vigour if they are properly cultivated. They will succeed in any sunny bed or border, and may be planted in masses, lines, or clumps, as fancy directs. The ground should be well dug and manured with old dung; and if it is of a heavy clayey texture, it should be well mixed with sand and leaf-mould. The ground must be prepared to receive the bulbs early in October, when a fine sunny day should be chosen for planting them. Plant them about 3 inches deep and 6 inches apart, and finish by laying a mulching of roughish stable-litter, old tan, or coal-ashes on the surface of the bed or clump. Should frost prevail in spring, when the leaves begin to get near the surface of the ground, the mulching should be increased in depth so as to protect them from injury; but this is rarely necessary. They require no further attention beyond that of keeping the surface of the bed trim and clean after the leaves and scapes pierce the ground, and supporting the flowers when necessary, till the end of May or the beginning of June, when they may be lifted in order to make room for summer-flowering occupants, and laid closely together, with a little soil over their roots, in a moderately sunny warm spot to mature their growth, after which they may be cleaned by removing the decayed leaves and fibres, and stored away in a cool room till planting time. There are special selections of unnamed sorts, in different shades of blue, white, red, and yellow, made by nurserymen and bulb-merchants for this purpose; and they may be procured in mixture or in separate colours, the mixed roots being least expensive. The different colours of Hyacinths do not all bloom at one time; and for massing in mixture purposes, and continuous mixed lines, it is necessary on this account to plant at different depths in order

to have the display as nearly as possible simultaneous in all its variety. Blue generally comes away first, and next in order red, white, and yellow. Blues should therefore be planted deepest, say 7 or 8 inches, and the others proportionally shallower, in their order.

H. amethystinus (*Amethyst Hyacinth*).—This is a pretty little species from southern Europe which blooms a little later than the varieties of *orientalis*. It has not, so far as I am aware, been productive of any variations. The leaves and stature are similar to those of the *orientalis* varieties, only the former are perhaps rather shorter and narrower than those of that group generally. The racemes are loose and open, and the flowers are bell-shaped, with six bluntish lobes, and are beautiful amethyst blue.

Lilium (*Lily*).—This is a grand and much-admired genus of bulbous plants. A large number of important additions have been made in recent years to the genus both in species and varieties; but there are many described and figured yet to introduce. Most of the species are hardy in any part of the country, and perhaps all are so in the most favoured districts. Such, however, as *L. giganteum* flowers too late in the season to be available in most years, in any district, out of doors. The majority of the recently-introduced species and varieties are both rare and expensive, and many are yet untried for out-of-doors decoration; but neither the expensive nor the untried will be included in the following selection, as there are many old favourites and well tried, from which selection may be made without fear of loss and disappointment in the end. The Lilies are a very brilliant group, comparatively neglected, but becoming more popular; their stately style, and elegant, gaily-coloured, and often perfumed flowers, are becoming better known and appreciated; and the genus is doubtless destined in the future to perform an important part in the hardy-flower garden. They are capable of being grouped by themselves with splendid effect, furnishing, as they do, ample variety of colour and feature to render such a group most attractive. And such groups might be still further enhanced in effect by having the surface of the ground carpeted with low-growing plants, in green or grey tones of foliage, or with dwarf-flowering plants, in tints harmonising with those of the Lilies themselves.

They are beautiful mixed-border subjects, the taller species being fine background plants; and the dwarfer ones, in fitting positions, are equally telling and desirable in mixed arrangements. The strong growers are also beautiful objects when planted amongst dwarf shrubs, in such a way as that their in-

florescence may be seen overtopping the shrubs. And they are so easy to cultivate in any position, that there is no obstacle in the way of their being generally adopted for any of the purposes indicated. They like light, warm, rich loams, with a good deal of slowly-decomposable vegetable matter in them, best ; and do worst in heavy clays or close tenacious loams and poor sandy soils. They are especially fond of peat, and when plenty of it is available, it matters little what may be the nature or texture of the soil if the drainage is good, because a free admixture of peat and sand will make the compost all that is required for them. The Lilies should be lifted and replanted every three or four years, but not oftener than every three years, for mere cultural reasons ; although, if they are not allowed to lie too long out of the ground, they may be lifted every year, if considerations of arrangement or other circumstances should require such a course. The best time for lifting and replanting Lilies is in the autumn, when the stems have become ripe ; and, as before stated, the roots should not be allowed to lie about exposed to the weather, but kept as short time as possible before being replanted. There is a popular notion that bulbs at rest cannot be injured by being exposed to the sun and air for a length of time ; and so far as bulbs of the types of *Gladiolus*, *Hyacinth*, and *Tulip* are concerned, the notion is well enough founded : but with bulbs of a scaly nature, of which those of the Lily are the type, it is different, for they suffer very much indeed by great and continued exposure ; and hence the frequent failures in bought bulbs, which may have been long and badly stored in the shops. The bulbs should be planted from 4 to 6 inches deep, according to the climate of the locality and the character of the soil. If the climate and soil are wet and cold, the bulbs should be placed the deeper, and if they are warm and light, they will be safe at the shallowest figure ; but the greater depth will protect them from any frost we are likely to experience in this country. Additional precaution may, however, be taken with the more rare species and varieties, till they become more plentiful, by laying some protecting material, such as old tan, stable-litter, coal-ashes, or, where it is available, old peat, to the depth of several inches, over the place occupied by the roots ; but indeed, even when not required for the purpose of protection, a mulching of a manurial kind is advisable, as it gives additional strength to the plants. Lilies are in fact gross feeders, and make a handsome return for generous diet. They are increased by offsets from the bulbs, which are in most species freely produced. Certain species also, such as *L. bulbiferum* and *L. tigrinum*, produce

bulbils in the axils of the leaves, by which they may be freely increased if they are planted in a rich bed in a well-sheltered border.

L. bulbiferum (*Orange Lily*).—A very handsome and well-known plant in gardens. It has been productive of some good varieties, but the variations, from a floricultural point of view, consist chiefly in slight differences of stature and shades of colour; and those of stature are, in some cases at least, more the result of soil and culture than fixed peculiarities of nature. It grows from 2 to 3 or more feet high. The stems are clothed with lance-shaped leaves disposed rather irregularly. The flowers are erect, open, bell-shaped, and marked inside with rough wart-like processes, and are deep orange-red. Flowers in June and July. Native of southern Europe and the Levant.

L. canadense (*Canadian Orange Lily*).—A beautiful species, growing 3 or 4 feet high. The stems are clothed with oval lance-shaped leaves arranged in whorls. The flowers are nodding or pendulous and bell-shaped, and the segments are somewhat reflexed; in colour they are pale orange, spotted with deep purplish-brown. Flowers in July and August. Native of Canada.

L. candidum (*Common White Lily*).—This is one of the commonest species in gardens. It grows about 3 feet high, producing the greatest abundance of its leaves at the roots and base of the stems. They are broadly lance-shaped, diminishing in size as they ascend the stem, and are arranged in a scattered alternate manner. The flowers are pure white, with no warts internally; are erect or nearly so, long, bell-shaped, and open, but slightly if at all reflexed at the mouth. Native of the Levant. Flowers in June and July. There is a double-flowered form in gardens under the name *L. candidum flore-pleno*, and there are two or three sorts with different styles of variegated leaves, and there is a flowerless form which produces in the place of the flowers a spiral spike of lance-shaped pure-white leaves or bracts, which is more curious than ornamental.

L. Catesbæi (*Catesby's Lily*).—A very distinct species from Carolina. It grows about 18 inches or 2 feet high. The stems are clothed with narrow lance-shaped leaves, irregularly and alternately disposed. The flowers are erect, large, and open, with reflexed segments, yellow, and spotted with dark brown in the centre, and shading into deep red towards the extremities of the segments. Flowers in July and August.

L. chalcedonicum (*Scarlet Martagon Lily*).—This is an old inhabitant of gardens. It grows from 3 to 4 feet high. The stems are well clothed with flat lance-shaped leaves. The

flowers are pendulous, with much-reflexed segments, and are bright red or scarlet: they open in July and August. Native of the Levant.

L. davuricum (*Dahurian Lily*).—This species resembles *L. bulbiferum* in its large, erect, open, bell-shaped flowers, which are deep red, yellowish in the centre, and dark-spotted. The leaves are lance-shaped, and the plant grows 2 or 3 feet high. The flowers appear in July and August. Native of Dahuria.

L. longiflorum (*long-flowered White Lily*).—This species grows about 18 inches or 2 feet high, with shining lance-shaped leaves. The flowers are large, long, and bell-shaped, with spreading but not reflexed segments; they are rather dull white externally, but very pure white inside, and warted towards the base. Flowers in June. Native of China. There are some varieties of this species characterised by differences of stature and the size of the flowers, but, so far as I am aware, there is no variation in the colour.

L. Martagon (*Martagon Lily*).—This is another old inhabitant of gardens, and is pretty well known under the name Turk's-Cap Lily. It grows about 3 feet high. The leaves are oval, lance-shaped, arranged on the stems in whorls. The flowers are pendulous, with much-reflexed segments, and are usually purplish red or livid red; and there is a white-flowered form also. Flowers in July and August. Native of Germany, France, and Italy.

L. monadelphum (*Monadelphous Lily*).—This species grows about 3 feet high. The leaves are lance-shaped, clothing the stems rather thickly. The flowers are pendulous, pale yellow or lemon-coloured, and spotted in the centre with deep red; the segments are reflexed. The stamens are, as the name implies, monadelphous, or united at the base. Flowers in July. Native of the Caucasus.

L. philadelphicum (*Philadelphian Lily*).—This species grows about 4 feet high. The leaves are in whorls. The flowers are erect, open, bell-shaped, deep orange shading to yellow, and becoming spotted in the centre with dark purple spots, and the segments taper below into longish stalks. Flowers in July and August. Native of North America.

L. pomponium (*Pomponian Lily*).—This species grows about 3 feet high. The leaves are narrow, lance-shaped, blunt below, but becoming shorter and narrower and sharply pointed above. The flowers are pendulous, the segments reflexed and warted internally towards the base. Native of Siberia and south-eastern Europe. Flowers in June.

L. pyrenaicum (*Pyrenean Lily*).—This species grows about 2 or 3 feet high. The leaves are narrow, lance-shaped; the

flowers are pendulous, and warted and dotted internally, and yellow; the segments are reflexed and narrow, and bluntly lance-shaped. Flowers in June and July. Native of the Pyrenees.

L. tenuifolium (*Small-leaved Lily*).—A very dwarf species, attaining only 1 foot or 18 inches high. The leaves are narrow, lance-shaped, and scattered alternately on the stems. The flowers are pendulous, the segments much reflexed, and bright red or scarlet. They appear in June and July. Native of Siberia.

L. Thunbergianum (*Thunberg's Lily*).—This is related to *L. bulbiferum*, and bears considerable resemblance to it. It grows about 18 inches or 2 feet high. The leaves are lance-shaped, increasing in length as they ascend the stem, and are crowded or whorl-like under the flowers. The flowers are large, open, bell-shaped, with spreading, slightly-reflexed segments; are bright orange, but nearly destitute of the warts that are so conspicuous in the Orange Lily. There are many varieties of this species, some of which are to be seen in catalogues and gardens under the specific names *L. atrosanguineum*, *L. venustum*, and *L. fulgens*; and there are other varieties, distinguished by different shades of colour, by spots, and the degree of prominence in the warts; and there is a double-flowered form of deep colour, very handsome; but both it and some of the others are yet rare and expensive. Flowers in July and August. Native of Japan.

L. tigrinum (*Tiger Lily*).—This is one of the most common species. It grows 3 or 4 feet high. The leaves are lance-shaped, alternate, clothing the stem rather thinly. The flowers are pendulous, and the segments much reflexed, warted internally, and bright salmon-red, with dark-brown spots. Of this species there are also several varieties, some of which are yet rare and expensive. Flowers in July and August. Native of China.

Muscari (*Grape Hyacinth*).—A very pretty group of dwarf spring-flowering bulbs. Two of the species selected are well known and very generally cultivated; the other two are not so familiar, although one of them is the most effective, as regards colour, in the group, and the other is one of the most deliciously perfumed of flowers, whether hardy or tender. They are easily grown in any ordinary garden-soil, are propagated by offsets, and for that purpose may be lifted every second year; but otherwise they should not be disturbed oftener than every four years, when they will be the better for being divided and receiving a change of soil.

M. botryoides (*Grape Hyacinth*).—This species produces erect, narrow leaves, from 6 to 9 inches long. The flower-scapes are about the length of the leaves, bearing a lax raceme of globose lively blue flowers, which open in April and May. Native of many districts of southern Europe. There is a handsome white variety.

M. comosum (*Tasselled Grape Hyacinth*).—This has broadly-linear leaves, flaccid and spreading and glaucous. The flower-scape is from 6 inches to 1 foot high, bearing a very open long raceme of somewhat angular cylindrical flowers, and having six rather long spreading teeth at the mouth of the tube. They are purple, and supported on stalks about twice their own length. Native of southern Europe. Flowers in April and May. There is a singular monstrosity of this species, commonly known as the Feather Hyacinth. It exceeds the species both in stature and in ornamental effect. It grows about 18 inches or 2 feet high. The flowers are cut into numerous thread-like processes, and the pedicles and main stalk assume the same colour as the flower, and the whole inflorescence often exceeds 1 foot in length, and has a charming and graceful appearance.

M. moschatum (*Musk Hyacinth*).—So far as colour is concerned, this is one of the least attractive plants imaginable. They are green or greenish yellow, and set in most rigid style on the short stiff scape; but they are deliciously fragrant—and for that reason, if for no other, it should be in every collection of plants. But apart from the colour of the flowers, it is a neat little subject, forming handsome tufts of stout, channeled, glaucous leaves, arching outwards, and lasting longer green and pleasing than those of any of its kindred. Flowers in May, June, and July. Native of the Levant.

M. racemosum (*Star Hyacinth*).—A very common spring-flowering bulb in most old gardens. It produces long flaccid leaves, pale green, and more or less prostrate. The flower-scapes are erect, about 6 inches high, terminating in close racemes of egg-shaped, deep purplish-blue flowers, with the teeth closing the mouth of the tube white. Flowers in April and May. Native of southern Europe.

Ornithogalum (*Star of Bethlehem*).—This is an interesting and pretty genus of hardy and half-hardy bulbs. The hardy section are mostly spring-flowering plants, and are less numerous and varied in character than the tender section. They are easily cultivated in any good garden-soil, and need not be frequently disturbed when doing well; and once every four or five years will be often enough to divide them. They are propagated by offsets.

O. arabicum (*Large-flowered O.*)—This grows about 1 foot or 18 inches high, producing an umbellate corymb of pure-white flowers. The leaves are narrow, linear, and channeled. Native of Sicily and the Levant and northern Africa. Flowers in April.

O. exscapum (*Short-scaped O.*)—About 4 inches high, with a wide-spreading corymb of white flowers. The leaves are linear, with a silvery middle line. Flowers in April. Native of Italy.

O. narbonnense (*Narbonne O.*)—About 1 foot or 18 inches high. The scape terminates in an oblong raceme of white flowers. The leaves are narrow, linear, and channeled. Flowers in June and July. Native of France and Italy.

O. umbellatum (*Common Star of Bethlehem*).—About 6 to 9 inches high, with linear, channeled leaves, having a silvery line down the centre. The scape supports a wide-spreading corymb of pure-white flowers. Flowers in April, May, and June. Native of southern and central Europe, and in Britain at least naturalised.

Scilla (*Squill*).—This is a lovely genus of chiefly early-flowering bulbs. They are indispensable where spring flowers are in request for any purpose, whether for furnishing cut-flowers or decorating the parterre or rockwork or mixed border. They are easily cultivated in almost all kinds of soil, but prefer good strong rich loam to any other, and dislike light, dry, sandy earth most. They are best left undisturbed if doing well; and as they do not, in most cases, increase very rapidly by offsets, and so become quickly overcrowded, there is little reason for frequent removals; and in soils which do not agree well with them there often ensues considerable disaster therefrom. This applies mainly to the very early and smaller species, such as *S. bifolia* and its varieties, and *S. sibirica* and its varieties. Others, such as *S. italica* and *S. nutans*, being more fertile in the production of offsets, may be divided more frequently; but they, too, make the finest displays when left undisturbed for years together. When division becomes necessary, it should be attended to immediately after the foliage declines.

S. amœna (*Pleasing Squill*).—This is a handsome and vigorous species. It is sometimes grown as *S. sibirica*, to which it is related and bears some resemblance. The leaves, when the plant is growing in congenial soil, are often a foot long and an inch broad, and are pale but lively green, flaccid, and nearly equal in width throughout, and abruptly sharp-pointed. The flower-scape varies in height from 6 to 9 inches, is erect, and sharply angular, and supports several large, flatly-bell-shaped flowers, with six wide-spreading divisions. They are dark porce-

lain-blue, and the ovary or seed-vessel is greenish white, and furnishes an agreeable contrast to the blue of the corolla, as it is conspicuous immediately the flower opens. Flowers in early April. Native of the Tyrol and central Europe and the Levant.

S. bifolia (*Earliest Squill*).—One of the most beautiful as well as the earliest of our hardy Squills. It forms tufts of spreading dark-green leaves 6 to 9 inches long, narrow, lance-shaped, channeled throughout, and incurved near the point, where the margins ultimately meet and form a thickened point. The scapes are about the length of the leaves, slender, and terminating in a one-sided raceme of deep-blue flowers. The flowers open in February, March, and April. Native of southern and central Europe, the Levant, and Russia. There are numerous varieties in cultivation, and amongst the best are *S. bifolia præcox*, syns. *S. bifolia major* and *S. præcox*, in which the colour is the same as the type, and the chief distinctions are in its earlier-blooming quality, and the larger size of the flowers; *S. bifolia rosea*, syn. *S. rosea*, a very beautiful form, with fine rose-coloured flowers; and *S. bifolia alba* and *S. bifolia candida*, both with white flowers, but in the latter they are pure white, and larger than those of the former.

S. campanulata, syn. **Endymion campanulata** (*Bell-flowered Squill*).—This approaches in character some of the varieties of *S. nutans*, the Blue-bell. It is a large-growing species, producing channeled, linear, dark-green leaves, about 1 foot long and 1 inch wide, sharply pointed. The flower-scapes are about 1 foot high, and stout, supporting a pyramidal raceme of open bell-shaped flowers, deep blue in colour. It is a variable species in cultivation as regards the colour, there being many shades of blue, and pink, or rose, and an excellent pure-white variety, named *S. c. alba*. It is a native of southern Europe. Flowers in May and June.

S. italica (*Italian Squill*).—A vigorous species, growing about 9 inches high. The leaves are lance-shaped, bright green, about 6 or 9 inches long. The flower-scapes are erect, supporting an upright short conical raceme of small pale slaty-blue flowers. Flowers in April, May, and June. Native of central and southern Europe, and a free-growing species in any soil. There is an excellent white variety, named *S. i. alba*.

S. nutans, syns. **Hyacinthus non-scriptus** and **Endymion nutans** (*Blue-bell Squill*).—This is the common Blue-bell Hyacinth so abundant in groves in many parts of England. There is no good reason why it should not be made as abundant in northern woods as it is in southern ones. It is indigenous

and hardy, increases rapidly, and in naturalising it would require similar treatment to the Snowdrop. It is much like *S. campanulata* in growth, stature, and habit, but is easily distinguished from it by the gracefully-arching one-sided racemes of nodding cylindrical flowers, the segments of which are sharply rolled back at the points. The most common colour is blue, but there are numerous other shades, of which the following are the most distinct, *S. n. alba*, *S. n. cærulea*, *S. n. rosea*, and *S. n. carnea*. Besides being indigenous, it is a native of south-western Europe. Flowers in May and June.

S. peruviana (*Corymbose Squill*).—The nearest claim that this grand Squill has to be considered Peruvian is, that it is found in Spain and other parts of south-western Europe, but it has never been found in South America. The leaves are broad, linear, or lance-shaped. The flower-scape is stout and erect, and terminates in a corymbose raceme at first, very flat, but lengthening out in flowering into conical shape. The flowers are fine deep blue, and the stamens conspicuously white. They appear in May and June. It flowers freely only in warm sunny aspects, and in light, rich, warm soil. There is a good white variety named *S. p. alba*.

S. sibirica (*Siberian Squill*).—A lovely small-growing species, which, till recently, was surrounded with confusion in gardens at least. It bore many names, as many as six synonyms being quoted by Dr Masters in the 'Gardeners' Chronicle' in 1868, in an article in which he cleared up the confusion, and confirmed the name *sibirica* by right of priority. The leaves are from 4 to 8 inches long, and $\frac{1}{2}$ inch wide, are strap-shaped, and contracted and thickened at the point. The flower-scapes are angular, slender, and at the time of flowering exceed the length of the leaves somewhat; but the leaves ultimately become longer. The flowers are beautiful azure-blue, somewhat bell-shaped, with open spreading segments. There is a variety named *S. s. amœnula*, with smaller and paler flowers; but it appears to be the only variation in colour recorded, and is inferior to the type. Native of Persia and Asia Minor. Flowers in March and April.

Trillium.—A very beautiful and singular genus from North America. Not any of the species are common in cultivation, and they are reputed difficult to keep; and they are undoubtedly so if their requirements are not attended to. They are naturally shade and moisture loving plants, delighting in deep, moist, cool soil, not fastidious as to the components of the soil nor its texture if the points of depth and moisture, without stagnation, are secured; and, provided with these conditions, they may be grown with fair success in positions exposed to the full sun; but

their development is better under partial shade. They are beautiful border or rockwork ornaments, and excellent for fringing the margins of beds of shrubs, where they may have some chance of shelter from rough wind. They are propagated by division of the roots, but they do not increase rapidly, and should be disturbed as little as possible for that purpose when they are doing well. They thrive best, and increase most abundantly, in deep peat and loam. The best time to divide is immediately after the leaves decline.

T. grandiflorum (*Large-flowered T.*)—This is the handsomest of the family, and a very beautiful as well as singular plant. It grows from 6 to 18 inches high. The leaves are three in number on each stem, arranged opposite each other at the summit; they are broadly egg-shaped, dark olive-green, and conspicuously ribbed and veined. The flower, one to each stem, springs from the centre of the leaves on a short stalk, and is supported in a slightly pendulous position; it consists of three green sepals and three pure-white petals. They open in April, May, and June.

T. pendulum (*Pendulous-flowered T.*)—Similar in aspect to the last, this differs from it chiefly in the leaves being more sharply rounded at the base, and more abruptly sharp-pointed. The flowers are white, but more decidedly drooping, and the petals are broader at the base, and are more acutely pointed. The plant grows from 6 to 9 inches high, and the flowers begin to open with those of the Large-flowered T., but do not continue so long.

T. sessile (*Stalkless-flowered T.*)—Not less interesting and singular, this species is less beautiful than either of the last two. The leaves are oval, tapering gradually to both ends from the centre. The flower sits stalkless and erect on the top of the stem between the leaves. The sepals are spreading, the petals erect, not opening wide as in the two previously described. They appear about the same time, and the plant grows about the height of the last species.

Triteleia uniflora, *syns. Leucocoryne uniflora* and **Milla uniflora** (*One-flowered T.*)—So far as I am aware, this is the only species of this handsome genus of bulbous plants that has been proved capable of culture in the open ground. They are American plants, mostly from the southern parts of that country; and there are four or five species, including the present subject, in cultivation. This is one of the handsomest. It produces linear flaccid spreading leaves about 9 or 10 inches long. The flower-stalks are about the length of the leaves and erect. The flowers tubular, with a broad-spreading limb divided in 6

segments; they are pure white, with a line of delicate blue along the middle of each segment, spreading wider as it descends to the base of the segment. The flowers are delicately scented if they are not bruised in handling; but on being bruised, both the flowers and leaves smell like garlic. They appear in spring and early summer. It grows freely in any ordinarily good soil, but should have good drainage to prevent stagnation, but will take ample supplies of water when growing. Easily increased by means of the offsets from the bulbs. Native of Buenos Ayres. Other beautiful *Triteleias* are *T. conspicua odorata*, *alliacea*, and *porrifolia*. They are all handsome pot-plants, and easily managed in that way in a cold frame, the pots being plunged and kept rather dry in winter; and they may be flowered in rooms or in the greenhouse.

Tritoma.—A splendid genus of plants, and all the more valuable that their display is produced very late in autumn. It is limited in species, and two of those that are in cultivation are not hardy in the northern parts of Britain. These are *T. Burchellii* and *T. Rooperii*, both fine plants, but inferior in effectiveness to *T. Uvaria*, which is undoubtedly hardy in all parts of the country. In the south those two more tender and later-flowering species may succeed in warm sheltered spots—and I have seen *T. Rooperii* stand mild winters in the north, reserving its flowers till the month of May. *T. Burchellii* I have not seen tried in this way, but it is less handsome than *Rooperii*, and scarcely worth much trouble when we have the alternative in the same type of the gorgeous *Uvaria*. They all prefer light, rich, sandy loam, or peat and loam, well drained, but delight in heavy drenchings of water in the summer and autumn. Propagate by division of the crowns.

T. media, syn. **Kniphofia media** (*Smaller T.*)—This is an old inhabitant, and not an uncommon ornament of shrubbery borders. It grows from 18 inches to 2 feet high, producing masses of soft, fleshy, sub-glaucous leaves, about as long as the plant is high. The flower-scapes are erect and the spikes short, and the flowers are orange red. They appear irregularly, never many spikes together, from early summer till early or late winter; and often in mild winters they continue sending up a spike occasionally throughout that season. Native of the Cape of Good Hope.

T. Uvaria, syn. **Kniphofia Uvaria**.—In the west of Scotland they have dubbed this splendid plant “Bailie Nicol Jarvie’s Poker,” and the name fits the plant better than a spike of it would have served the Bailie in his perilous circumstances. The plant has become very popular within the past twelve or

fourteen years, and deservedly so, for we have no more beautiful autumn-flowering hardy subject. Its style of growth and gorgeous colouring are grand and unique. There are several varieties of it, all of which are of high merit, but the one which is most free in flowering is that named *T. U. glaucescens*. It has leaves of great length, often in rich soil 3 or 4 feet long, at first erect, but ultimately arching outwards; they are very narrow, and deeply channeled and prominently keeled, and the sectional outline is sharply triangular; their colour is glaucous, and the edges and keel are rough from short bristles. The scape, when luxuriant, attains a height of 4 or more feet, and as the spike lengthens and becomes heavy, it becomes top-heavy and falls over if not supported. The flowers are cylindrical, fine yellow at the tips, shading quickly into the rich vermilion of the lower part of the tube; and the spike itself is somewhat club-shaped, being widest in the centre, owing to the flowers taking a more horizontal position there, and being pendent both above and below. It flowers in August, September, and October; and in very late localities, where it flowers imperfectly in autumn, I have seen it throw up a few spikes in the earlier months of the succeeding summer; but in most parts of the country its flowering is done in autumn. The next most useful variety is *T. U. grandiflora*, and a fine plant it is in the south, but quite valueless in the north, owing to its later-flowering quality. At this place (Minto) it grows freely, and is perfectly hardy; but the scapes are so late in moving, that the spikes are never fully developed in all their beauty before the rigour of winter sets in and cuts them down. Often in early summer we get a crop of weakly spikes of the previous season's formation, but they are never fine. It is very distinct, and as *Tritomas* are characterised, it might fairly pass muster as a species. The leaves are shorter and much wider at the base than those of *T. U. glaucescens*; they are never erect, but from the first have a tendency to arch outwards and recurve. They are destitute of any glaucous tint, and their edges and keel are smooth, or nearly so. The scape is rigid, upright, very stout, and tapering from the base upwards, and never inclines to break over unless in exposed positions, where they may suffer damage from storms of wind. The spike is pyramidal, being widest at the base and tapering somewhat upwards, and the flowers nearly uniform scarlet, or faintly marked with yellow at the tips. *T. Uvaria* is a native of the Cape of Good Hope, as are all the species of *Tritoma*.

Tulipa (*Tulip*).—This splendid genus has been of the highest interest to florists for centuries—much less so now than it was two hundred years ago, when large fortunes changed hands often

in the purchase of single bulbs of what was then regarded a novelty or an acquisition. The extravagance manifested in our day in the purchase of Orchids and other rare and expensive plants seems parsimony as compared with that of the Tulip-fanciers a couple of hundred years ago. We do occasionally hear of an Orchid that will not be sold for a hundred pounds, but we do not hear that it has met with a purchaser at that price; and yet that is a trifle when compared with the sums (often as much as £500) given for the bulb of a Tulip in those days. That must have been the kind of extravagance that suggested the adage about a fool and his money, if it did not exist before; for it is difficult to believe that any one in the possession of his senses could have been satisfied with such a bargain. The varieties of florists' Tulips can now be had at a very cheap rate, and are admirable materials for introducing into mixed borders, shrubbery margins, and the spring flower-garden on the "bedding" or massing plan. They are the progeny of *T. Gesneriana*, a species indigenous to the Levant and southern Europe. The Van Thol Tulips are the varieties of *T. suaveolens*, a native of southern Europe, and they too are gay subjects for the spring flower-garden and for indoor embellishment in pots in winter and spring. There are other species of Tulips less showy than the varieties of these two species, perhaps, but not less attractive in their simple and less pretentious beauty; and it is to some of these, as selected below, that I would draw attention, rather than the gorgeous beauties that cost so dear in past times. They are all hardy, and easily cultivated in rich light loam well drained, and are increased by offsets, but they are best left undisturbed for several years. They like warm sunny positions best, and are available for the front lines of mixed borders, rockwork, and suchlike positions. Division and replanting should take place immediately after the leaves decline.

T. Celsiana (*Cels's T.*)—This species grows from 6 to 12 inches high. The leaves are glaucous, channeled, and shorter than the flower-scape. The flowers are yellow inside, greenish-brown externally, and the petals are sharply lance-shaped and spreading when fully expanded. Flowers in May and June. Native of southern Europe, in Montpellier and Narbonne.

T. Clusiana (*Clusius's T.*)—A charming species, about the same stature as the last. The bulbs are small and covered with down. The stems are erect, and exceed the length of the leaves, which are narrow lance-shaped. The flowers exceed in size those of the last species. The petals are broader lance-shaped, reddish externally,—the three outer ones white on the

inner face, the three inner ones purple and white,—and a deep purple spot marks the base of each petal. Found about Nice, Florence, and the south of France. Flowers in April and May.

T. montana (*Mountain T.*)—A very brilliant and distinct species, growing about 9 inches high. It has slender leafy stems. The leaves are narrow lance-shaped, sharply pointed, and deeply glaucous and channeled. The petals are egg-shaped, sharp-pointed, deep crimson or scarlet, and spreading. They open in early summer. Native of Persia.

T. præcox (*Early-flowering T.*)—This species grows about 9 inches high. It has stout erect stems. The leaves are broadly lance-shaped, concave, and fringed with hairs. The flowers are erect; the petals concave; the three outer furnished with short sharp points, and fringed with hairs—the three inner are blunter, and destitute of the fringes. All are bright scarlet, and open in April. Native of Italy, about Provence.

Veratrum.—A small genus of plants, remarkable for the unique style of their leaves and the elegance of their branching racemose inflorescence. Individually the flowers are small, but collectively they are, in combination with the peculiar character of the leaves, striking and effective when well placed among other mixed herbaceous plants. They are adapted for background plants in any position, being tall and bold in character, and for foliage or “subtropical” gardening they are among the best subjects we have of a hardy nature. They are suitable also for naturalising in warm well-drained positions in open woods and about shrubberies. A deep, rich, well-drained loam is the soil they prefer above all others; but, provided the drainage and depth are good, the texture and components are of less moment. In poor thin soil, however, they never develop their foliage well; and as the foliage is their principal attraction, they should not be attempted in such soil. They are propagated by division and by seed—the latter should be sown as soon as possible after ripening in small pots in a cold frame, when they will germinate freely the following spring; but if kept long in dry store after they are ripe, they lose vitality. Division is best done in early spring, and should be carefully gone about, taking care to secure fibres with each crown.

V. album (*White Hellebore*).—The common name is not a very correct one to apply to a plant of this natural order, but its leaves ground to powder yield the White Hellebore which is so potent a remedy against caterpillar on the gooseberry. The plant grows about 3 or 4 feet high. The leaves are elliptical, much plaited and ribbed, and downy on the under side. The flowers are small, consisting of six spreading, greenish-

white segments, and are arranged in erect branching racemes. They open in July and August. Native of mountain pastures in many parts of central and southern Europe.

V. nigrum (*Black Hellebore*).—This is even more stately and striking than the last species. The leaves are similar in form, and are plaited and ribbed in the same manner, but are broader and bolder every way. The racemes are less dense and more freely branched, and the flowers are blackish-brown. The flowers open in July and August, and the plant inhabits similar habitats to the last, but is more widely diffused in southern Europe.

Other species of *Veratrum* worthy of a place where their characteristics are valued, are *V. viride*, with acutely-elliptical much-plaited hairy leaves and green flowers, and *V. virginicum*, with simple racemes of rather large brown flowers, both flowering about the same time as the two first described, and both from North America, where *viride* is named Poke or Swamp Hellebore.

Yucca.—This is no herbaceous genus—indeed it is in some species rather arborescent than herbaceous; but not a few of the forms comprised in it are hardy, and adapted by stature and appearance to association with herbaceous plants, and to other special purposes noticed in these pages. They are not free-flowering plants; and there is no certainty of enjoying their flowers often in a lifetime, especially in the northern districts of Britain. Their chief recommendation for ornamentation is their foliage and style of growth, both of which are peculiar amongst hardy plants. The *Y. gloriosa* is the best known of the family in British gardens, and furnishes a good general idea of the appearance of the whole of the members; but some are less arborescent, making little or no stem—others are the opposite, and make considerable stems with greater rapidity than that species; but in all there is the same character of leaves, linear and aloe-like, and more or less rigid, varying chiefly in length, breadth, and substance, in the relative direction they assume with regard to that of the stem, whether they are erect or ascending, horizontal or more or less recurved—and in the nature of the margin, whether it is entire or furnished with thread-like appendages. In all, the flowers are nearly the same in colour, yellowish-white, and are produced in simple or branching racemes. They are easily cultivated, preferring light, rich, sandy, well-drained soil, and succeeding badly in heavy clay, especially if wet. They are propagated by suckers, which in some species are freely produced after flowering, and in others more or less freely at all times. Those with simple unbranching stems, and

with little or no tendency to make suckers, are propagated by cuttings—a slow process, on account of their unwillingness to branch, even when cut over for that purpose. Cuttings root very freely, but can never be had in great abundance. Seed, when they can be got, will be the readiest way of getting up a stock of any of the sorts; but British-ripened seed of *Yuccas* will ever be rare out of doors at least, owing in part to the lateness of the season at which they flower, and in part also to the unfrequency with which they do flower. Besides being useful for associating with mixed herbaceous plants, *Yuccas* are very characteristic subjects for introducing singly or in groups, for associating with other striking plants about lawns, or for planting on or in the neighbourhood of rockwork; and they may also be introduced into groves where the soil and other circumstances are favourable. With the exception of *Y. flaccida* and *Y. gloriosa*, I cannot speak with any confidence of the hardiness of the others in the following selection in the north. *Y. aloifolia*, *Y. angustifolia*, and *Y. filamentosa*, are occasionally used for filling vases, &c., in flower-gardens in Scotland; but they are generally afforded some kind of winter protection either in the greenhouse or vinery or shed; and they are so useful for such purposes that they are well worth protection, such as they require. But in most parts of England, especially in situations near the sea, all that are selected are hardy when planted out in the ground; but any of them, if used for filling vases, will require protection in winter, as their roots being more exposed in that way are liable to injury from frost. *Y. aloifolia* may be considered the least hardy of the selection.

Y. acuminata.—This species does not produce much stem quickly, nor are the leaves numerous, though they are densely packed together. They are about 2 feet long, and nearly 2 inches broad at the middle, decreasing in width gradually towards the point, but more quickly towards the base. They are dark green, and slightly glaucous and concave on the upper face.

Y. aloifolia.—A very handsome species, producing numerous leaves less crowded than in the last. They are about the same length as those of the last, but are narrower, thicker, flat, or nearly so, and the margins are beset with minute teeth. There is a beautiful variegated form named *Y. a. variegata*. Native of the Southern States of North America and some parts of South America.

Y. filamentosa.—This is a well-known species which makes little or no stem. The leaves are crowded, $1\frac{1}{2}$ or 2 feet long, and about 2 inches broad, deep green, and when young slightly

glaucous, and the margins are furnished with long twisted white threads. There is a handsome variegated form named *Y. f. variegata*. Native of the Southern States of North America.

Y. flaccida.—This is also a well-known species, which, like the last, produces little or no stem. The leaves are 18 inches or 2 feet long by 2 inches broad, are thinner in texture than any of the preceding, and in the older ones becoming suddenly bent or broken over, in consequence of which the plant lacks that neatness which characterises most other *Yuccas*; the edges of the leaves are furnished with the threads of *filamentosa*, but less abundantly, and they are not so clear white.

Y. gloriosa.—Another well-known species, producing a considerable stem, but rather slowly, which is more or less inclined to branch. The leaves are 2 or 2½ feet long, and 2 or 3 inches broad, generally concave, and marked with longitudinal folds or plaitings. They are very rigid and erect, or nearly so when young, but the older leaves are ascending, and scarcely at any time horizontal, and the margins are destitute of threads. Two varieties of the species are known in gardens under the specific names *Y. superba* and *Y. glaucescens*, and they may both be considered worthy of a place, as in point of foliage and habit they differ from each other and from the type to a considerable extent. The latter has deeply glaucous leaves, and is rather more luxuriant than the type; and the former has shorter and stiffer leaves, also glaucous, but is not so luxuriant as the type. Native of America.

Y. recurvifolia.—This species makes a considerable stem, which branches somewhat freely. The leaves are from 2½ to 3 feet long, and 2 or 3 inches broad, in dense heads. They are thick and leathery, and dark green, and destitute of any threads on the margins. They are erect at first, but soon arch outwards and become recurved. Native of the Southern States of North America.

Y. rufo-cincta differs very little from the last in appearance, but has more or less distinct brown margins to the leaves.

PONTEDERÆ.

Pontederia.—A genus of aquatic plants with ornamental foliage and flowers that should be better known wherever waters are to be furnished with characteristic plants. There are three species well known to cultivation, though not often

seen outside botanic gardens in this country. They are easily propagated by division and by seed, which should be sown as soon as it is ripe; or if to be transported from their habitats in America, it should be bottled in water. It is best sown in pots—small ones—which may be dropped either to the bottom of the water in the position they are intended to occupy, or into any tank in a stove or greenhouse, to facilitate germination, afterwards to be transferred to their permanent quarters. Division may take place in autumn, winter, or spring. Water from 18 inches to 3 feet deep is the depth they like best.

P. angustifolia (*Narrow-leaved P.*)—This species produces narrow lance-shaped leaves, with a cordate base, and bluntish-pointed. The stalks clasp the stem, which varies in length according to the depth of the water. The flowers are small bright blue, in close spikes, and appear in summer and autumn.

P. cordata (*Heart-shaped-leaved P.*)—This species is very similar to the last, but is larger in all its parts. The leaves are oblong, heart-shaped, or nearly arrow-shaped at the base, and the flowers are larger than, but about the same colour as, the last, and appear about the same time.

COMMELINACEÆ.

This is a peculiar and interesting group of plants, some of which are very ornamental. The family abounds most in tropical or warm regions, and furnishes only a few species of *Tradescantia* and *Commelina* that are capable of enduring our climate. As the hardy species in both genera are all very much alike in colour, blue being the prevailing tint, and as there is no great diversity of habit or other characters, a limited selection from each will suffice.

Commelina cœlestis (*Sky-blue C.*)—A very pretty, free, and continuous-blooming plant from South America. It forms dense masses of much-branching stems, clothed with lively green leaves, oblong lanced-shaped, and sheathing the stems with their stalks. The corolla is composed of three oval bright azure petals, and the filaments are furnished with glands. There is a beautiful pure-white-flowered variety named *C. c. alba*, and both produce masses about 18 inches high, more or less profusely covered with blossoms from early summer till frost cuts them off. It delights in light, sandy, rich, well-drained

soil ; peat and loam, well sharpened up with grit, is the most congenial compost. The roots are fleshy, and liable to suffer from severe frosts ; it is advisable, therefore, to cover them on the approach of winter with coal-ashes or old tan to the depth of several inches. In cold wet districts the roots may be lifted and stored in a dry cold frame in dry leaf-mould or ashes, or the plant may be treated as a half-hardy annual, sowing the seed in heat, and pricking off into small pots as soon as the plantlets are fit to handle, hardening them off by degrees, till they may bear full exposure to the outer atmosphere, and finally turning them out into beds or borders about the end of May. The roots, if lifted and stored in winter, will be the better for a start in slight heat in spring, and may be increased by division.

Tradescantia virginica (*Virginian Spiderwort*).—A very elegant border-plant, exceedingly easy to cultivate. Like the last, it likes a rich, light, sandy, well-drained soil and warm position, but is much hardier, being capable of withstanding the rigour of British winters in any part of the country, provided the soil is well drained and light ; in wet heavy soils it will be necessary to cover the roots with some such materials as are recommended in the case of the last subject. All the *Tradescantias* grow beautifully in pure sandy peat. They are propagated by division in spring. Their fittest place is the mixed herbaceous border, and they are good rockwork ornaments where the rock-garden is extensive. The present subject grows about 18 inches high, branching freely. The stems and branches are clothed with lively green lance-shaped leaves, clasping the stem with their bases. The corolla consists of three purplish-blue petals, and the filaments are densely clothed with spreading hairs. The flowers appear from early summer till late autumn. There are several varieties differing in colour from the type—the principal are : *T. v. alba*, the petals white, with the hairy filaments purple ; *T. v. flore-pleno*, blue, or the colour of the type, but more continuous, and the individual flowers lasting longer ; *T. v. rubra* and *rubra flore-pleno*, purplish red ; *T. v. rosea*, beautiful rose ; and *T. v. violacea*, violet-blue.

GRAMINACEÆ.

Grasses are rarely seen in combination with flowering plants in any class of gardens. If they are grown at all, it is only to

the extent of a few of the annual species, for the sake of the grace which their flowers lend to bouquets of everlasting and other flowers in the decoration of rooms in winter; and they are grown in beds set apart for this purpose, as indeed they should be; for the necessity for cutting and picking them irregularly, in order to have them preserved in the best condition for the purpose in view, is incompatible with that order and tidiness which should prevail in beds or borders devoted to arrangements for effect. But the majority of the annual species are not well fitted for associating with other plants in groups for effect, on account of their very generally brief season—most of them flower and are over in two or three months from the time of sowing. The perennial grasses, like most other perennial plants, are slower in arriving at, and continue longer in, the beauty of their maturity; and most of them, from early summer till late autumn, remain in a state of graceful attractiveness of foliage or flower, or both combined. One or two varieties of common field-grasses, with variegated or glaucous foliage, have been used in the flower-garden along with bedding plants; and *Gynerium argenteum* has occasionally been used in flower-gardening and for outstanding objects and groups about lawns and the margins of water; but there has been no very general adoption of the grace of the grasses along with the gay colours of the common occupants of the flower-garden. They are very easily cultivated, growing for the most part well in any good garden-soil, and none requiring peculiar soil or treatment are recommended here. They may be raised from seed; and as it is generally easily obtainable, that means is recommended as the best, especially in the case of *Gynerium* and other large grasses, which, when grown in light dry soils, are peculiarly difficult to divide successfully. The seed is best sown in small pots in a cold frame, and the plants, as soon as they are fit to handle, should be pricked off into sheltered nursing-beds; or, if circumstances admit of it, they may be kept under glass in cold frames, or be pricked out in a spent hotbed. The smaller perennial grasses and the variegated kinds may be propagated by division without any difficulty; and in the case of the latter, it is necessary to resort to this means in order to insure continuance of the variegation. Such species as *Gynerium argenteum*, *Arundo conspicua*, and *A. Donax*, delight in delugings of water during summer; but in the northern parts of Britain they require to be kept very dry during winter; and I have found them all improved in vigour, and less liable to become worn out in the centre of the tufts, by being annually lifted and replanted in fresh soil. The best time for doing this is after a little growth is made in spring, and that is also the

best time to divide the large-growing species, if it should be deemed desirable to increase them in that way; and in strong soils there is little difficulty in dividing them successfully if the divisions are not too minute.

Agrostis Steveni.—The general character of *Agrostis* as regards the inflorescence is grace, with a multitude of minute flowers in open slenderly-branched panicles; and this is a very elegant member of the family. It grows about 2 feet high, and is a graceful and attractive ornament of border or bed, and the flowers are valuable for mingling with other cut-flowers. Some of the annuals of this genus; such as *A. nebulosa*, are most elegant species.

Andropogon.—The species of this group vary a good deal more than the *Agrostis* group in their superficial characteristics, and especially in stature. The inflorescence is either in crowded bearded panicles, or in graceful silky ones.

A. Bombycinus.—A dwarf species, with small silky drooping panicles. Height about 1 foot.

A. strictus.—A tall handsome species about 4 feet high, with graceful silky panicles.

Arundo conspicua.—A very handsome grass, resembling Pampas-grass, but scarcely so vigorous and bold in character; nor has it proven generally so hardy. Height about 4 or 5 feet.

A. Donax.—A gigantic grass growing 8 or 9 feet high, with broad, flax-like, glaucous leaves, and the stems often woody at the base. There is a beautiful striped white-and-green-leaved variety, named *A. D. versicolor*, but not common in cultivation; both forms require ample supplies of moisture in the growing season.

Briza media.—An elegant little British Quake-grass, that should have a place in every collection of ornamental grasses. It grows from 1 foot to 18 inches high, with open spreading panicles of pendent spikelets of flowers, which are continually in graceful agitation.

Dactylis glomerata variegata.—An elegant dwarf-grass, with white variegated foliage; very handsome for edgings, too, in the flower-garden. It is a variegation of the common Cock's-foot grass, so abundant in rough pastures all over Britain. The flowers must be cut away as soon as they appear, as they injure the foliage and are not ornamental.

Digraphis arundinacea variegata, syn. **Phalaris arundinacea variegata.**—This is the common Ribbon-grass of gardens, and is an elegant plant. The flowers are not very ornamental, and should be cut away if the plant is cultivated for the leaves alone. The tufts in rich moist soil will reach the height of 2 feet.

Erianthus Ravennæ.—A vigorous-growing handsome species, with bold bronzy foliage and crowded plume-like panicles of flowers. Height about 3 or 4 feet.

Festuca ovina, var. **glauca**, syn. **F. glauca**.—A pretty dwarf grass, with deeply glaucous filiform leaves in crowded tufts about 6 inches high. The small panicles of flowers should be cut away as soon as they appear.

Gynerium argenteum.—A very handsome and not uncommon species, commonly known as Pampas-grass. It likes moist, deep, rich loam, a warm sunny position, and abundance of moisture in the growing season, but must be well drained in order to withstand the effects of winter in cold wet localities. There are different varieties of it, not permanent from seed, but all are beautiful, some having pure silvery plumes, and others being tinged with purple. The latter are the handsomest. Height from 6 to 9 feet.

Stipa calamagrostis.—A handsome species of Feather-grass growing about 2 feet high; the awns are graceful, feathery, and yellowish. The flowers of this and those that follow are admirable for mixing in bouquets, but are not very enduring as border ornaments.

S. capillata.—About the same height as the last, with the awns about 6 inches in length.

S. pennata.—The best known of the Feather-grasses, and a very beautiful plant, the feathery awns being very long and graceful. These *Stipas*, and the whole family, delight in warm, light, dry soil; in heavy wet clays they do badly, and they should not frequently be disturbed; they are years in many soils after severe division before they begin to grow well and flower.

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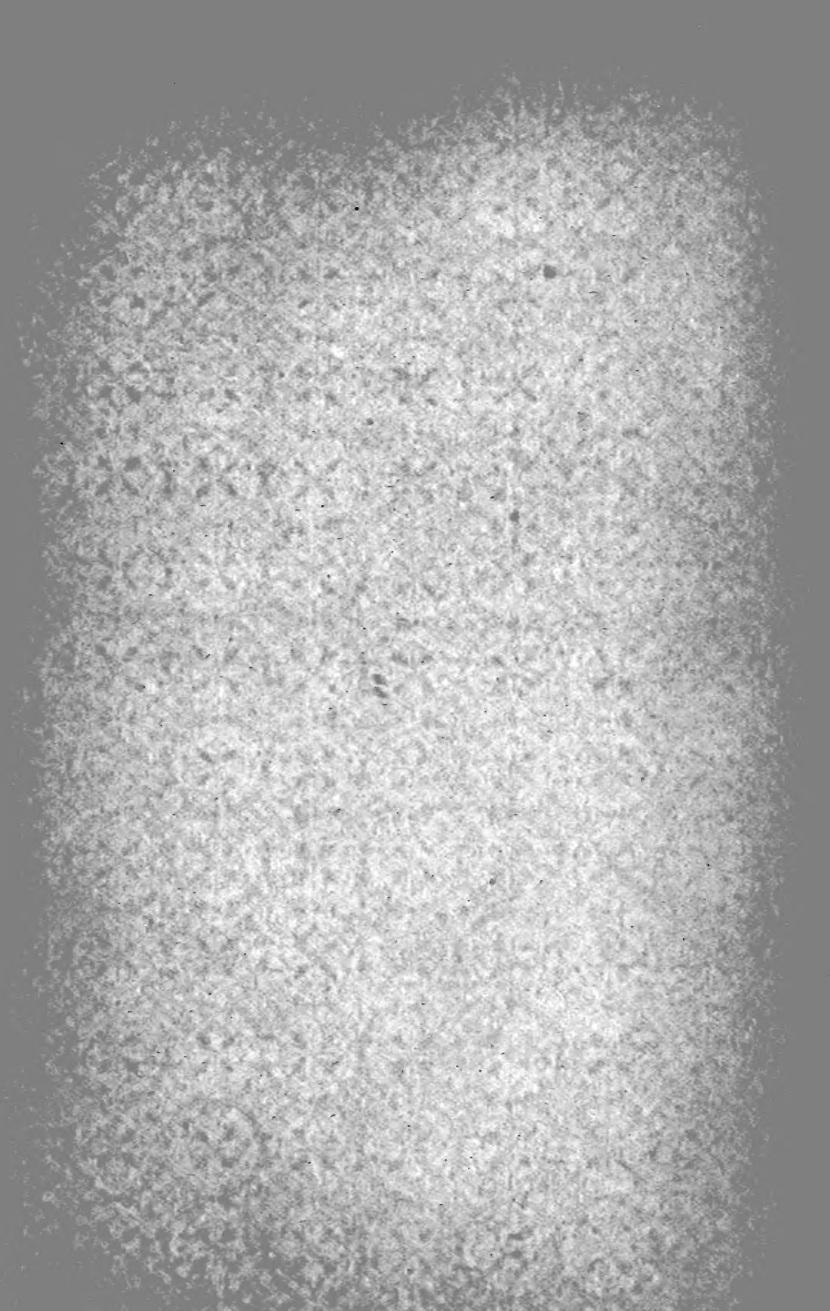
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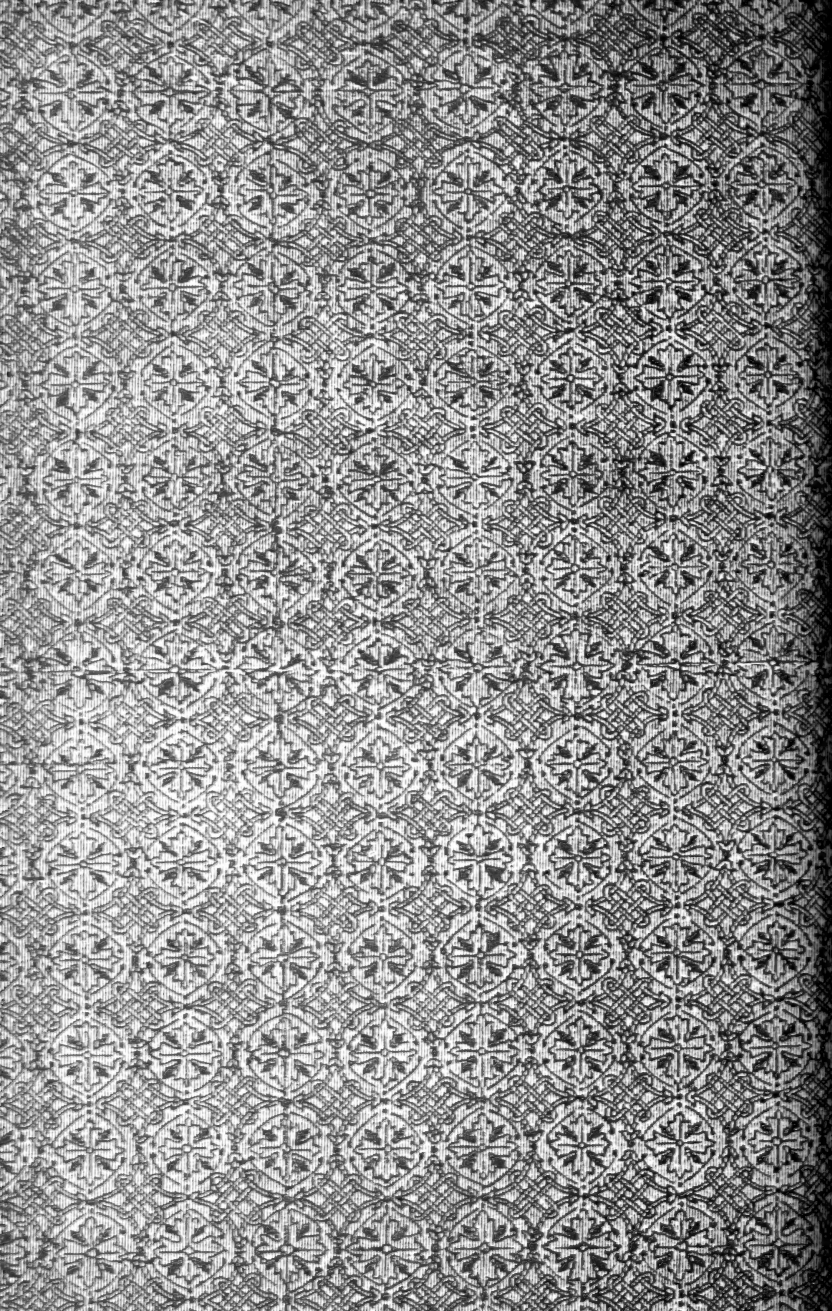
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